LONG ISLAND SINCLAIR TIMEX GROUP

L.I.S.T.ING

April 1985

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The Computer Magazine for Power Users

MEETING NOTES - MARCH 10, 1985

The March meeting of LIST was held at Harvey R's in Valley Stream. Outgoing President Nazir Pashtoon called the meeting to order at 2:30PM.

The Sec'y Treas. provided membership, renewal and funds status reports.

Elections were held for the Presidents position and Jeff Street was elected,unanimously. General discussion centered around the newletter. The overwhelming majority of the membership expressed their support for the content and editorial balance of LISTing. The consensus was however, that larger, darker print was needed, particularly for program listings. The Sec'y Treas. was asked to request all members, via LISTing, to do the following in preparing material for the newsletter.

1) Do not use Timex paper in the 2040 printer.
2) Radio Shack's paper (black) is recommended.
3) Use Dick Scovilles "BOLD" program, reprinted,and annotated, elsewhere in this issue.
4) Use another printer, but try to use 32 column format. This makes visual verification somewhat easier.

The newsletter editor was requested to provide instructions for using Dick's program. This has been done. The question of tape loading was reopened. There is clearly a lack of understanding of this procedure and/or a lack of suitable equipment among the membership. The editorial staff will research the various newsletters and magazines for data on Loading and Saving techniques. Members who have solved LOADing problems are urgently requested to send in descriptionsof the methods they use to help LOAD balky tapes. A future issue of the newsletter will be dedicated to this subject.

NEXT MEETINGS

Next LIST meeting will be in Centerport, N.Y. at 2:00PM on April 14th, 1985. See the "members only" page for directions.

The May meeting will be on May 5th, probably in Seaford.

Membership size is growing rapidly. If you know of an available church, school, library, etc., at which we can hold our Sunday meetings please bring your information to the April meeting.

The business portion of the meeting adjourned at 4:PM.

DEMOES

Nazir P. Demoed his ROM based emulator in a smart looking black box. Your editor received an earlier version (no black box) two months ago and has found compatibility to be at least 99% (E.g., Chequered Flag, Inferno, Survival, etc. all run).

Free copies of TS Horizons, graciously supplied by Rich Duncan, were distributed to those in attendance. John B. demoed some of the software he has been developing; very impressive, commercial quality, stuff.

After the meeting and demoes, Zebra Systems provided two TS book titles to the membership at $5.00 each. LIST Associates sold ROM's for $15, 16K RAM packs for $5.00 (all gone) and assorted Timex software for $1.00 each (Picked up at meeting).

NEXT MEETING

Paul D. and Nazir will demonstrate Spectrum networking and perhaps the RS-232 port on Interface I. We hope also to get P.W.C.'s-QL- and Bob G.'s RGB monitor together for a QL demo. There's a good chance that someone from Zebra will bring a Zebra Talker, as well.

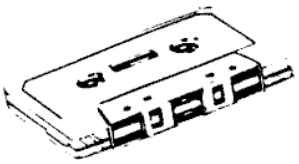
NOTE: QL-RGB monitor specs - Sinclair Research has sent Paul C. the necessary info. We'll publish it in May's LISTing.

Uncle Clive Wants You!

LISTing needs articles, particularly those of a straight forward, BASIC nature. Our newer members, in particular, need to know what you may now consider "old hat". Please share your discoveries and knowledge with them.

LIST GROUP
P.O. BOX 438
CENTERPORT, N.Y. 11721-0438

LIST



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LIBRARY TAPE NOTES

We wish to apologize to all of our members for the poor quality of Tape #2. While changes in staffing of the library have caused some confusion, our big problem appears to have been our Sears dubbing deck. This has been sent out for repairs. The 4 "defective" programs on tape #2 will reappear on #3.

Our thanks to H.L.W. Pulliam for pointing out the problem.

Also, please note that some copies did not have the write protect tab removed. If you have the tape in your possession now, we ask that you break it out, right now, to prevent accidental erasure of the program. We have received partially erased "master" tapes back in the past.

By the same token, some of the member supplied tapes have been erased or have unusable noises on them. We will be more careful (and unfortunately slower) in producing tape #3. You are requested to do likewise. Please double check that your programs LOAD before sending out the tape.

To help in this endeavor, tape #3 will contain an "alignment" section. If you have a spare type player, we strongly recommend that you adjust its head alignment to the LIST standard.

LISTing Policy:

Annual Dues.....$15.00 Issue Price $1.50 (includes P&P)

One "Sample" copy sent upon receipt of large SASE.

Copies provided on exchange basis with other bona fide user groups.

L.I.S.T.ing is published monthly by LIST (Long Island Sinclair Timex) Group a not-for-profit users group.

Your reviews, programs, comments, hardware projects, etc., are eagerly solicited for publication in LISTing.

Please note our new address - P.O. BOX 438, Centerport, N.Y.11721-0438 Mail sent to the old address must be forwarded there and will take longer to reach us.

NOTE: PARTIAL YEAR MEMBERSHIPS AVAILABLE

Normal membership year is Feb. through Jan. at cost of $15.00.(US) By keeping as many members as possible on that basis, we keep our costs and chances of error down.

If you wish to begin subscribing later in the year, please sign up for the end of this year and all of next.

We will accept partial years or different subscription runs, on a limited basis (particularly from members outside the U.S.) But, please be aware that, addition to possible rate increases, your "account" must be handled "by hand" and errors may occur. International (UK Canada) subscribers will receive as many issues as we can afford to mail.

Classified Ads

WANTED: MEMOTECH RS-232 INTERFACE FOR T/S 1500.
A. NIEUWENHOFF 16 HERITAGE RD. SUTTON, MA. 01527

DK'Tronics Light Pen (for Spectrum - works on 2068 buss) $35.00 (includes P & P) LIST Associates, 10 Idle Day Drive, Centerport, N.Y. 11721.

If you have a program or article about something you've tried, please send it in. Our group interests are so varied that I can almost certainly guarantee that someone else can use your expertise to solve his problem.

POLICY ON CONTRIBUTED MATERIAL:

We are always looking for interesting articles, programs, reviews etc. to help keep our members informed and entertained. Articles submitted for publication are printed on the following basis:

1. You, the writer, maintain the full copyright and can resell, lend or give away your work, as you wish.

2. We are granted the right to publish your material, in the original issue in which it appears. Reprints (e.g., to supply orders for back issues) will include your material as a part of its original issue. We are not allowed to sell your material in any other way, without your express written consent;

We can't (for now) pay you for your material, but you will recieve a copy of the issue in which it is published, even if you're not a member. You may get more than one issue and you will definitely earn the respect and appreciation by your greatful peers.

HARDWARE REVIEW: ZEBRA GRAPHICS TABLET

FOR: TS 2068
FROM: ZEBRA SYSTEMS, INC.
78-06 JAMAICA AVENUE
WOODHAVEN, N.Y. 11421
PRICE: $89 - INCLUDES ZEBRA PAINTER SOFTWARE ON CASSETTE

The Zebra "Graphics Tablet" is not so much a single hardware item, as it is a system which allows the user to create graphic screens on the TS 2068, quickly and easily. The system consists of three components; a KOALA technology tablet, the Zebra dual port A/D interface, and Zebra Painter software. We'll discuss each in turn, and then look at the use of the whole system.

The Koala "pad" has been reviewed in detail in a recent issue of Byte+ magazine, but will be briefly described here. The pad consists of a flat black plastic drawing surface about 4" wide by 5" high mounted in a beige frame which slopes down toward the user. The pad's rear is about 1 1/2" higher than the front and sports an umbilical which terminates, at the computer end, with a 6 pin DIN type plug. The pad's entire surface is, in essence, a variable resistor. by pressing down on a particular spot with either finger or the stylus provided, the user causes a discrete voltage level to be sensed by the A/D interface. Any single spot on the pad has a unique X and Y coordinate resistance. Resolution is said to be 256 X 256. The pad has two large "command" buttons just above the drawing area. These are used to select menu items, indicate the starting points of lines and tell the system you are finished with a command or function.

Zebra's A/D (analog to digital) interface is a small (2 1/2" X 3") single sided open board. It sports two six pin DIN jacks, one for each of its two analog ports (A&B). The board plugs onto the expansion buss connector at the rear of your 2068 and provides a male edge connector for feed through to other peripherals (e.g., the printer). In addition to the edge connectors and DIN jacks, the board has 14 available (DIP) holes which can be used to access the two ports, a fairly common A to D convertor chip, and a chip for very simple decoding and the requisite resistors for biasing and set points.

Decoding involves the use of A4,5,6,7, $\overline{RD}$ & $\overline{IOREQ}$ (any port below 'F') while the ADC itself uses A1,2 & 3, and AØ feeds the ADC's clock input.* There are, in effect then, eight channels for analog data on Zebra's board. For the 'B' port, the one used with the graphics tablet, these are:

	Similarly:
0,1 = X axis (0 to 255)	8,9= X axis (A Port)
2,3 = Y axis (")	10,11 = Y axis (")
4,5 = Right Button	12,13 = Right (A)
6,7 = Left Button	14,15 = Left (A)

When not using the Koala pad, the user can treat the "button" ports as conventional analog ports. Port A uses the odd number ports. Outputs for the ADC go directly to the 2068 data buss. The two ports allow you to use analog joysticks (try Radio Shack), temperature sensors (thermistors) and some types of photocells, as well.

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* This last is a very clever design trick, which helps reduce parts count. Without giving away the "secret", let's just say that it would be a valuable mental exercise to visuallize the state of AØ as your Z80 executed its instructions. Can you also see potential problems with this method?

The final component of the Zebra System is Jeff S.'s Zebra painter software. While not as comprehensive as some of the Spectrum graphics software, it should still provide a more than adequate screen drawing environment, particularly for the novice. Extensive use of on-screen menus is made. The user has only to point the stylus at the section of the Koala pad which corresponds to the screen item desired, and touch the control button to have the job done. The Software features Ink and Paper, Line and Circle commands, the ability to exchange the active screen with one in memory, a Lefty feature, pixel coordinate axes, orthogonal lines mode, and others.

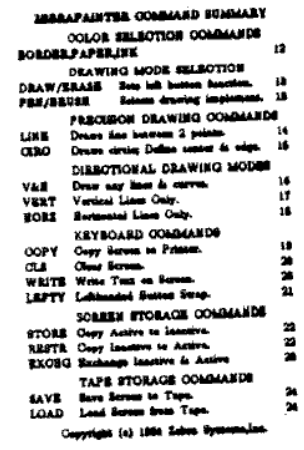
Pictures can be saved on tape and/or TIMEX printer. Zebra painter is easy to duplicate, and instructions for so doing are provided. Finally, you are permitted to add text to the drawing and change the brush to a pen, if desired.

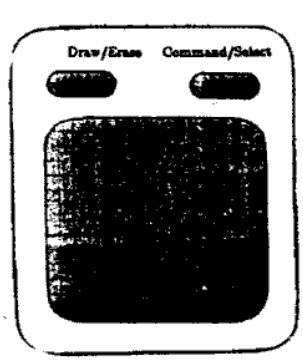
Overall, I found the system easy to set up and use for graphics development. The small (3" X 4") manual supplied, while not perfectly printed, should be adequate for most users. The board was neatly constructed and cleverly designed and laid out.

On the negative side, I'd like to have seen the unit in a case and the numbers not scraped off the chips (it takes me 10-15 minutes longer to figure out what they are, that way). While I applaud Jeff Streets Zebra painter software, particularly in light of the time constraints he worked under, I would like to have seen a few more features included. Specifically, "Painter" could use: Fill, Box and Triangle commands. The documentation, while adequate for the tablet, should have included information on other uses of the A/D interface; e.g., voltage levels, sources of DIN plugs, addresses, the use of the BASIC IN statement, etc.

At $89 the Zebra Graphics Tablet System is a good value. The software, tablet and interface (which has many other uses) can serve as a valuable addition to your TS 2068, and can save hours of time for those of us interested in developing our computer graphic skills. I give the system an 8.5 out of 10. Technical documentation and more advanced software would each have earned the system .5 more points.

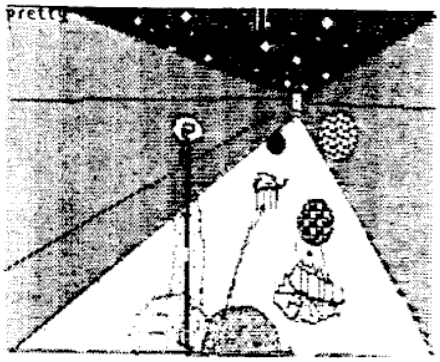
Two final points; one good; one bad. First, the bad news; due to a number of factors (Software and sampling rates, are two) the graphics system suffers from what Jeff S. calls "spray". This consists of extraneous dots which appear in the vicinity of your stylus point when you either move too fast, or relax your pressure on the pad for an instant. These must be erased to make a good drawing. This is easy to do, but still an inconvenience. On the plus side, the graphics interface is theoretically ZX81, TS1000 and Spectrum buss compatible. I've tried it on my "Spectrus" (a 2068 with ROM and a 2068 with Spectrum buss and emulator), using the IN command and it works.

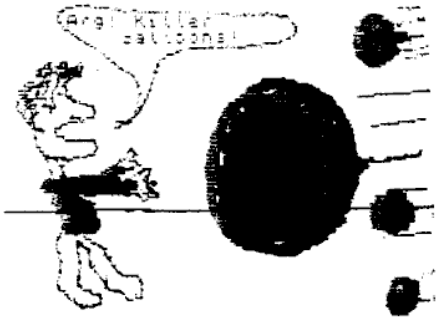


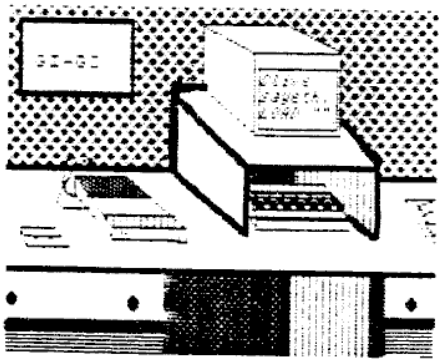


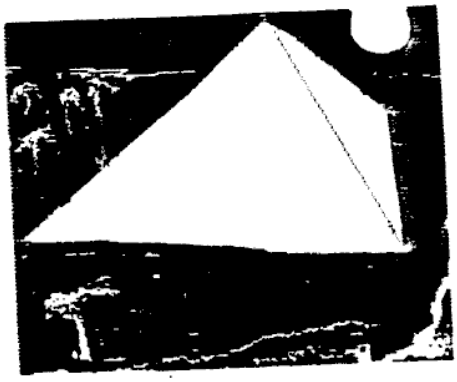
Graphics

List Group

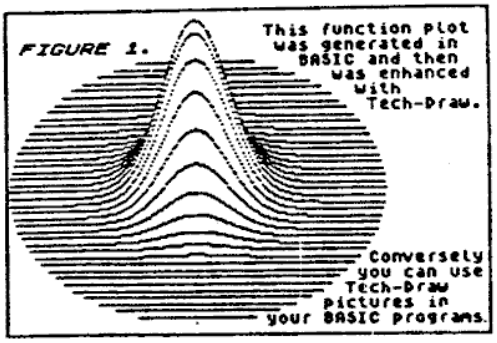


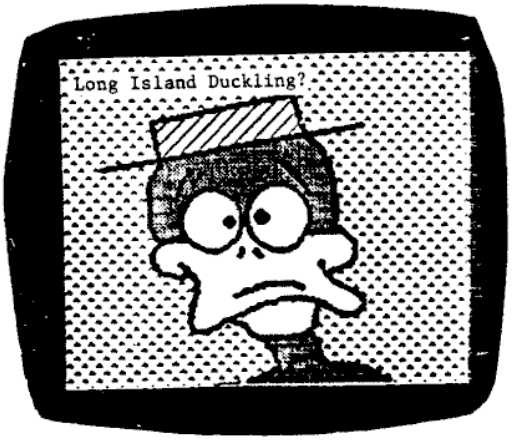






Manually Enhanced





DOMSDOS

One of our new members, Don Ross (formerly a CEO for a large Computer Corporation and now engaged as Manager of Previously Owned Vehicle Dispositions, for Montauk Studebaker) has provided us with this BASIC listing. He obtained this from one of the British Magazines. DOMSDOS is a complete DOS, written in BASIC, which, it is claimed, will work on any U.K. Domestic (thus DOMS) microcomputer. I believe DOM's transcription contains an error or two, as I got an error message (variable not found) the first time I tried to run it. If anyone can adapt this to run on the TS 2068, please let us know.

```
  5 REM "DD"
  7 REM DOMSDOS
 10 RESTORE
 20 LET U=1: LET N=0: LET I=0
 30 DIM E$(100)
 40 READ E$(I): IF E$(I)<>"END"
THEN LET I=I+U: GO TO 40
 50 REM -HOME-: PRINT "[TAB 3-T
O MOVE CURSOR TO SCR. TOP
 60 PRINT "      DOMSDOS      "
 70 PRINT "      VERSION 13   "
 80 PRINT "(C) COPYRIGHT STATE
HATCHERIES,1984"
 90 PRINT : PRINT
100 REM CCP ROUTINES
110 INPUT A: INPUT A;">A$"
111 REM INPUT"A:>";A$
120 IF RND=(1)<M2 THEN PRINT A$
"?": PRINT : GO TO 110
121 REM ===
130 REM ERGOT ROUTINES
140 IF S=Z THEN LET S=INT (RND+
(U)+N+U)
141 REM +++
150 PRINT : PRINT E$(S): PRINT
151 REM E$(S)>>>
160 IF S>0 THEN LET S=S+W: IF R
ND+(U)*2<W THEN LET S=Z
161 REM RND +++
170 GO TO 100
180 DATA CANT CONTINUE ERROR
181 REM  CAN'T
190 DATA FRANKLY CANT CONTINUE
ERROR
191 REM CAN'T
200 DATA CANT TAKE ANY MORE ERR
OR
201 REM CAN'T
210 DATA BOOS ERR ON P
220 DATA DISC DRIVE INOPERABLE
230 DATA MAIN BUS FAILURE ERROR
240 DATA ARE YOU SURE
241 REM     SURE?????
250 DATA I MEAN ARE YOU REALLY
SURE
251 REM     ????
260 DATA COMMAND NOT RECOGNISED
270 DATA REBOOT AND RETRY
280 DATA DIVISION BY ZERO ERROR
290 DATA DIVISION BY ZERO ERROR
AGAIN
300 DATA PLEASE RECONSIDER
301 REM     'SIDER...
310 DATA PLEASE PLEASE RECONSID
ER
320 DATA PRESSING WRONG KEYS ER
ROR
330 DATA FIRE ON MAIN BOARD ERR
OR
340 DATA YOU CAN'T BE SERIOUS
ERROR
341 REM   CAN'T-B-IOUS!
350 DATA TRY KEYING HELP
351 REM     'HELP'
360 DATA KEY SYSGEN TO RECOVER
361 REM     'SYSGEN'
370 DATA ILLEGAL QUANTITY-CALL
POLICE
380 DATA OUT OF MEMORY
390 DATA OUT OF SIGHT
400 DATA OUT OF MIND
410 DATA TOO MUCH
411 REM     MUCH !
420 DATA TOO COMPLEX
430 DATA MUCH TOO COMPLEX
440 DATA NEXT WITHOUT FOR
450 DATA FOR WITHOUT NEXT
460 DATA FOR WITHOUT FOR
470 DATA NEXT WITHOUT NEXT
480 DATA GOTO UNDEFINED
490 DATA GO TO JAILDO NOT PASS
GO DO NOT COLLECT 200
491 REM     $200
500 DATA BAD SUBSCRIPT
510 DATA NAUGHTY SUBSCRIPT
520 DATA EVIL SUBSCRIPT
530 DATA SYNTAX ERROR
540 DATA SYNTAX CURRENTLY 15%
541 REM                 15%
550 DATA FILE LOCKED
560 DATA FILE MISSING
570 DATA FILE MISSING BELIEVED
KILLED IN ACTION
580 DATA LANGUAGE NOT AVAILABLE
590 DATA LANGUAGE NOT PRINTABLE
600 DATA UNSPEAKABLE ERROR
610 DATA PROGRAM TOO LARGE
620 DATA PROGRAM TOO SMALL
630 DATA RANGE ERROR-AIM HIGHER
640 DATA WRITE PROTECTED
650 DATA REALLY WRITE PROTECTED
660 DATA READ PROTECTED
670 DATA READ AND WRITE PROTECT
ED
680 DATA NOT WORTH READING ATAL
L FRANKLY
690 DATA END
```

Quick-Reference Keyboarding Guide

ABS (G)	**LOAD** (J)
AND (shifted-2)	**LPRINT** (shifted-S)
ARCCOS (S)	
ARCSIN (A)	**NEW** (A)
ARCTAN (D)	**NEXT** (N)
AT (C)	**NOT** (N)
BREAK (SPACE)	**OR** (shifted-W)
CHR$ (U)	**PAUSE** (M)
CLEAR (X)	**PEEK** (O)
CLS (V)	**PI** (M)
CODE (I)	**PLOT** (O)
CONT (C)	**POKE** (O)
COPY (Z)	**PRINT** (P)
COS (W)	
	RAND (T)
DELETE (shifted-0)	**REM** (E)
DIM (D)	**RETURN** (Y)
	RND (T)
EDIT (shifted-1)	**RUN** (R)
EXP (X)	
	SAVE (S)
FAST (shifted-F)	**SCROLL** (B)
FOR (F)	**SGN** (F)
FUNCTION (shifted-ENTER)	**SIN** (O)
	SLOW (shifted-D)
GOSUB (H)	**SQR** (H)
GOTO (G)	**STEP** (shifted-E)
GRAPHICS (shifted-9)	**STOP** (shifted-A)
	STR$ (Y)
IF (U)	
INKEY$ (B)	**TAB** (P)
INPUT (I)	**TAN** (E)
INT (R)	**THEN** (shifted-3)
	TO (shifted-4)
LEN (K)	
LET (L)	**UNPLOT** (W)
LIST (K)	**USR** (L)
LLIST (shifted-G)	
LN (Z)	**VAL** (J)

From McGraw-Hill

April 1985

LIST GROUP

More on Darkening the Printer

Dick Scoville

My original plan was to make the following program an example in this month's machine code tutorial and explain it line by line, but it requires some familiarity with so many things that it's best just to give it as is. The idea is very simple: write a new character set. Don't panic, the program itself will do all the work for you in the twinkling of an eye. Here is the program, in Z80 mnemonics and in decimal and in hex--all 29 bytes of it:

```
57786 LD DE,00DD      56576
57789 PUSH DE
57790 LD BC,0003      768
57793 LD HL,(365C)    CHARS
57796 INC H
57797 LD A,(HL)
57798 AND A
57799 RRA
57800 OR (HL)
57801 LD (DE),A
57802 INC HL
57803 INC DE
57804 DEC C
57805 JR NZ,F6        57797
57807 DJNZ F4         57797
57809 POP HL
57810 DEC H
57811 LD (365C),HL    CHARS
57814 RET
57815 NOP
57816 NOP
57817 NOP
```

```
17  0   221 213 1   0   3   42
54  92  36  126 167 31  182 18
35  19  13  32  246 16  244 225
37  34  54  92  201
```

```
11  00  DD  D5  01  00  03  2A
36  5C  24  7E  A7  1F  B6  12
23  13  0D  20  F6  10  F4  E1
25  22  36  5C  C9
```

Do the following:

1) CLEAR 56575
2) LET sdk=57786
3) Enter the 29 bytes of code starting at address 57786
4) Peek them to be sure they are OK.

Now RANDOMIZE USR sdk will give you a new alphabet, which will be used by LPRINT, LLIST and COPY from now on. If you want to recover the old original alphabet, simply POKE 23607,60.

Yes, we're reprinting Dick Scoville's fine Darkening program again (thanks too, to Triangle User Group). There seems to have been a little confusion on how to enter and use it.

The first listing given is assembly code. You cannot enter this unless you have an assembler. What Dick is doing here is copying the existing character set into high RAM (above 56576), all 768 bytes of character codes, while rotating each character to the RIGHT one dot and superimposing this "new" version over the old (OR (HL)). This puts an additional dot to the right of each original one in a character and gives the impression of bolder print.

The second and third listing give the decimal and hexadecimal values of the codes for the machine code instruction. For example:

MEM LOC	Decimal Value	Hex Value	Assembler Code	Means
57786	17	11*	LD DE,	Load the DE Register Pair with the next two Bytes you find
57787	0	00	00	The addresses are always "backward", So
57788	221	DD	DD	this is DD00.
	which is: 56576	DD00	DD00	This will be the the start of our "alphabet"
	also: 54,92	36,5C	5C36	The original character set in ROM is pointed
which is	23606			to by this System variable.

Examples of Machine Code Loaders are to be found in a number of the library programs. In this case, it might be just as easy to write one. Follow Dick's instructions and use the following program (or your own) at step 3.

```
1   REM Clear 56575
2   REM Let skd = 57786 (sdk is the start of Dick's code)
10  Restore
20  For I = sdk to sdk+29
30  Read a: POKE I,a
40  Print I; " "; a; " "; PEEK I
50  Next I
(55 DATA 17,0,221,213,1,0,3,42
(56 DATA 54,92,36,126,167,31,182,18
(57 DATA 35,19,13,32,246,16,244,225
(58 DATA 37,34,54,92,201,0,0,0
60  Stop
100 Randomize USR sdk
110 LIST
```

Make sure all the values are correct e.g., 57518 should contain 201, the RETURN (to BASIC) command. If a value is wrong, simply poke it with the correct number. Once all has been entered correctly GOTO 100 and your machine code is safely tucked away above RAMTOP.

You can now safely new the MC loader program out of existence. (We assume you SAVE'd either the LOADER program and/or the CODE already. If not, save the program in the normal way, for posterity); save the code with SAVE "BOLD" CODE 56576, 1240. Then, to use "BOLD" simply LOAD "BOLD" CODE and Randomize USR 57786. To return to a standard character set, POKE 23607, 60. (What would happen if you POKE it with 221?)

Please use "BOLD" whenever you send in a program listing for publication in LISTing. This will make your listing much more legible, especially when photo-reduced.

Again our thanks to Dick Scoville for a useful routine and one simple enough to help us learn to use Machine Code.

* That's one 16 and one 1 for a total of 17 decimal.

Communications

TBBS SYSTEM PROTOCOL

This section explains how TBBS handles the following features: Auto-logon, file uploading and downloading, and message entry and retrieval. If you have never used a TBBS system before you should print or save to disk a copy of these instructions. They will help answer some of the more common questions asked about how to use TBBS.

1. AUTO LOGON

For Auto-Logon, TBBS sends your terminal a decimal 5 (Control-E) at the "First Name?" question. Your terminal software should respond to this by sending your log on in the following format:

Firstname;Lastname;City,State

(Note the semi-colons separating the different portions with no spaces before or after them.)

2. UPLOADING PROGRAMS

TBBS supports four different upload methods (protocols). These are:

1. Prompted mode. The prompt character is the '>' (greater than) character. The reason for utilizing a prompt character is to allow a delay to occur when the system is writing to the disk. The prompt will not reappear until the system is ready to receive the next line of text. To use this mode your terminal software must stop sending after each <CR> (carriage return) until it receives the next '>'. You terminate the upload by typing 'END'. No input data line may be more than 255 characters long in this mode.

2. X-ON after <CR>. This mode is very similar to the prompted mode. Your terminal program must stop sending after each carriage return and wait for an X-ON (Ctrl-Q) to be sent by TBBS before continuing. You terminate the upload by typing 'END' on a new line. The 255 character maximum line length still applies in this mode. Again, you terminate by typing END after a carriage return.

3. X-OFF/X-ON. In this mode your terminal program sends characters until it receives an X-OFF (Ctrl-S) from TBBS. Your terminal program then waits for an X-ON (Ctrl-Q) to resume sending. It must ignore any other characters (except to display them if desired) while waiting for an X-ON. In this mode, there is no limitation on line length. You still terminate this mode by entering END after a carriage return.

4. CP/M MODEM Protocol. This is a public domain file sector transfer protocol first used by the CP/M community. Any terminal program which supports this protocol may be used. This is by far the most secure file transfer method since the data is checked for integrity and re-transmitted automatically if a bad character is received.

3. DOWNLOADING PROGRAMS

TBBS supports three protocols for program downloading:

1. ASCII with Buffer Control Codes. To use this mode your terminal program must recognize a Ctrl-R as a code for opening it's buffer. That is, when your terminal program receives the Ctrl-R it should start spooling all incoming data to a memory buffer. Upon receipt of a Ctrl-T it should stop spooling to the buffer. You then should have some method of dumping your memory buffer to a disk or tape file. Any non-ASCII software which appears in a download section will be sent as an ASCII Hex representation of the machine language program. It is then necessary to convert this hex code back to the standard '/CMD' type file. Programs to do this are available as public domain software from many sources. Some terminal software packages have it included either as a separate program or built into the buffer mode.

2. ASCII only, no control codes. In this mode TBBS just sends the file data only. You must capture it as best you can. A non-ASCII file will still be converted to an ASCII hex data format as in method 1.

3. CP/M MODEM protocol. This is the same error checking protocol described above in UPLOAD but with TBBS on the sending end. It is compatible with the public domain MODEMx.x series of CP/M programs.

4. X-ON, X-OFF Flow Control

TBBS supports X-ON, X-OFF flow control at all times when it is sending you data. At any time you may transmit the X-OFF (Ctrl-S) character and TBBS will instantly stop sending you output. Send X-ON (Ctrl-Q) to resume data flow to you. This allows your terminal program to stop character flow while it spools to disk anything you are saving. It also provides a means of manually stopping in Menus and other areas where the 'P' for pause feature will not work.

5. FULL DUPLEX OPERATION

TBBS operates in a full duplex configuration and is always looking for command input when it is sending output to you. This means that you do not have to wait for a menu to finish listing to give your next command. The command will be acted on after the next letter is printed on output. During Message or Text file output (such as this) the 'P' key will halt after the next character transmitted. When in this pause state a carriage return <CR> will resume with the next character, and an 'S' will abort the rest of the printout. Menu commands are always one character and do not require a <CR>.

6. HELP IN HIGHER LEVELS

When you initially log onto the system you are in the beginner user level. In this level the system supplies many helpful explanations and lengthy prompts. Also each command menu is fully displayed. If you set your user level higher the prompts become much shorter to save transmission time. If you need help, however it is close at hand. At the Command: prompt press '?' at any time to get a full menu listing. A <CR> will give you the intermediate display in Expert and Super Expert modes or the beginner display if you are in the intermediate mode.

7. MESSAGE ENTRY METHODS

TBBS supports three forms of message entry. These are the line mode, prompted block mode, and unprompted block mode. The line mode is intended for manually typed in messages (the most common type). It prompts for each line with a line number and the count of characters left in the message buffer. The two block modes are intended to allow uploading of messages which were prepared OFF-line and are transmitted in a block by a smart terminal program. The prompted block mode supplies a '>' prompt for each line and behaves much as the prompted upload described above. The major difference is that instead of typing 'END' on a line to stop, a null line (<CR> after the prompt character) will terminate message entry. The unprompted block mode is for terminal programs which do not support prompted upload. In this mode the echo is shut off and characters may be sent in a continuous stream (even at 1200 baud) until either two <CR>'s in a row (equivalent of a null input line) or the buffer limit of 2048 characters is reached. The most usual problem area in block message input to TBBS is when you wish to include a blank line in your text. You must put at least one space in the line or it will be interpreted as the end of the message being entered. When you have entered your message you will be given a set of options as follows:

<L>ist, <C>ontinue, <E>dit, <S>ave, or <A>bort?

<L>ist displays your entered text without word wrap and with each line numbered. The numbers are used for editing if you wish. Remember that TBBS will word wrap your message when it finally displays it so the lines may not come out exactly as you expect them.

<C>ontinue will place you in the line mode at the end of your message so you may add onto it.

<E>dit will ask you for a line number. Enter the number of the line you wish to change (as shown by <L>ist) and the current line will be displayed. You then re-type just this line as you want it to be.

<S>ave will save your message to the system's disk message base and exit back to the menu.

<A>bort will give up on entering this message. All text will be thrown away and you will be returned to the menu as if you had never done the ente' message command.

Our Thanks to Herbert W. for this download.

MICRODRIVE COMPATIBLE SOFTWARE

To the customer:

Now you have bought your Interface 1 you may be interested to know of some of the Microdrive compatible software currently available. The following list is of products which are currently endorsed by Sinclair as being Microdrive compatible. Except where stated they are not published by Sinclair, and Sinclair can therefore take no responsibility nor accept any liability for their quality nor fitness for the purpose for which they are being sold. The list is for information only and is intended to give you an opportunity of taking advantage of the Microdrive's fast loading facilities. The majority of these products allow you to take a back-up copy of the cassette onto a Microdrive cartridge, thus enabling you to load the product in seconds instead of minutes. In addition most of the programs allow you to store data relevant to the program on Microdrive cartridge.

Most of these products are available in the shops.
Should you wish to contact the suppliers direct, however, their names are given below, and addresses overleaf.

PROGRAM NAME	TYPE	SUPPLIER
Cash Controller	Business	Richard Shepherd Software Ltd
Supercode II	Utility	Supersoft Systems
Editor Assembler	Utility	Picturesque
Spectrum Monitor	Utility	Picturesque
Paymaster	Business	Willden Services Ltd
Masterfile	Business	Campbell Systems
Stock Control	Business	Kemp Ltd
Sales Ledger	Business	Kemp Ltd
Purchase Ledger	Business	Kemp Ltd
Hisoft Pascal	Utility	Hisoft
Hisoft Devpac	Utility	Hisoft
Bank Account system	Business	Bridgebrook Intek
Sales Ledger	Business	Hestacrest Ltd
Purchase Ledger	Business	Hestacrest Ltd
Cash Book	Business	Hestacrest Ltd
Nominal Ledger	Business	Hestacrest Ltd
Machine Code Test Tool	Utility	Oxford Computer Publishing Ltd (OCP)
Full Screen Editor/Assembler	Utility	OCP
Address Manager Plus 80	Business	OCP
Finance Manager Plus 80	Business	OCP
VAT Manager Plus 80	Business	OCP
Word Manager Plus 80	Business	OCP
Word Manager Standard	Business	OCP
Stock Manager Plus 80	Business	OCP
The Runes of Zendos	Adventure Game	Dorcas Software
D/E Accounts	Business/Educational	Cases Computer Simulations Ltd
Statspak 1	Business/Educational	Cases Computer Simulations Ltd
Friendly Face (cassette or on cartridge)	Utility (Provides for transfer of programs from cassette to cartridge)	Monitor Ltd
Business Bank Account	Business	Transform Ltd
Sales Day Book	Business	Transform Ltd
Purchase Day Book	Business	Transform Ltd
Stock Control	Business	Transform Ltd
Payroll	Business	Transform Ltd
Invoicing	Business	Transform Ltd
Superfile	Business	Transform Ltd
Sales/Purchase Ledger/Invoicing	Business	Transform Ltd
Reversi (also known as Othello)	Strategy Game	Games of Skill Ltd
16/48 (the monthly cassette magazine)	Magazine	16/14 Magazine Ltd
Matrix Operations/Linear Program	Utility	University Software
Regression/Statistics	Utility	University Software
Library of Advanced math/stat/econ	Utility	University Software
Tasword II	Word Processor	Tasman Software
Logo	Teaching Language	Sinclair Research Ltd

sinclair

Most of these software titles are available in the shops. If you wish to contact the appropriate suppliers yourselves please use the following address and phone numbers:-

Sinclair Research Ltd
Stanhope Road
Camberley
Surrey
GU15 3BR
Tel: (0276) 685311

Richard Shepherd Software Ltd
Elm House
23-25 Elmshott Lane
Slough
Berks

Supersoft Systems
91 Manor Road
Higham Hill
London
E17 5RY

Picturesque
6 Corkscrew Hill
West Wickham
Kent
BR4 9BB

Willden Services Ltd
2b Beaconfield House
Beacon Road
Crowborough
E Sussex
TN6 1AX

Campbell Systems
15 Rous Road
Buckhurst Hill
Essex
IG9 6BL

Kemp Ltd
43 Muswell Hill
London
N10 3PN

Cases Computer Simulations Ltd
14 Langton Way
Blackheath
London
SE3 7TL

Monitor Ltd
P O Box 442
Mill Hill
London
NW7 2JF

Transform Ltd
41 Keats House
Porchester Mead
Beckenham
Kent

Games of Skill Ltd
1 Francis Avenue
St Albans
AL3 6BL

16/18 Magazine Ltd
10 Barley Mow Passage
Chiswick
London
W4 4PH
Tel: 01-994-6477

University Software
29 St Peter's Street
London
N1 8SP

Hisoft
180 High Street North
Dunstable
LU6 1AT

Bridgebrook Intek
45 Burleigh Avenue
Wallington
Surrey
SM6 7JG

Hestacrest Ltd
P O Box 19
Leighton Buzzard
Beds

Oxford Computer Publishing Ltd
'Brimrod'
4a High Street
Chalfont St Peter
Bucks
SL9 9QB

Dorcas Software
3 The Oasis
Glenfield
Leicester

Software houses with commercial products compatible with the Microdrive, and wishing their products to be added to this list should write to the following address:

The Software Manager, Sinclair Research, Stanhope Road, Camberley Surrey, GU15 3PS

Try This!

```
  5 CLS : BEEP .5,1: POKE 23609
,75: POKE 23658,8
 10 INPUT "CASSETTE #, OR TITLE
? ";A$
 20 PRINT "LOAD ";A$;"   A"
 30 DRAW 0,175: DRAW 207,0: PLO
T 207,0: DRAW 0,175
 40 LOAD "↑↑↑↑"
100 PRINT "LOAD ";A$;"   B"
 LOAD "↑↑↑"
9999 SAVE "LIST": BEEP .5,1: CLS
: PRINT "REWIND, PLAY TO VERI
FY": VERIFY "LIST": BEEP .5,1:
PRINT "VERIFIED!"
```

LIST GROUP

CATALOGS RECEIVED

ACE Software
2 East Oak Avenue
Moorestown, N.J. 08057

Has 2 programs for the TS1000 & 2068; 'PAYOFF' Helps you manage your charge accounts. Payout - for home budgeting - Price $14.95 each

Aerco
Box 18093
Austin, Tx 78760

Disc Drives $99.
Interface for 2068, called FD68, has 64K RAM on board $199. & RGB Interface - TS 2068 only
Also - parallel or Serial Interfaces, seperately at $69 & $99.

Macshak Software
73-312 Ironwood Street
Palm Desert, Ca 92260

Has programs for 2068 & 1000 - examples: Keno for 2068 $19.95 + $2. P&H - Investicale for 2068 $19.95+ 2 P&H (Funds management)

Technology Research Ltd
Unit 18, Central Trading Estate
Staines, Middlesex TW184XE
England

Beta Disc Drive £ 95 + £ 17.50 P&H
for Spectrum 48K
We have catalog & some magazine reviews.

Tasman
Springfield House, Hyde Terrace
Leeds LS29LN
England

Complete line of word processors & interfaces for the Spectrum. Tasword II £13.90 Phone (0532) 43801

Software Supermarket
87 Howards Lane
London SW15 6NV
England

Good assortment of Spectrum Software - some hardware - Takes Visa - Prices - Full list including VAT, even on overseas orders.
01-789-8546 (24 hours)

Magnetic Media of New England
PO Box 780
Beverly, Ma. 01915

Nashu a DS/DD diskettes $1.09 each (for fifty) + 2.50 P&P. Fast Service (617) 927-0905

Quick Silva - Spectrum
Susan Ziegler
14307 Ben Brush
San Antonio, Tx 78248

Games - Spectrum (512) 492-8054

Lmar Ltd
POB 4442
Oceanside, Ca. 92054 -0835

H. [illegible]

Will buy or sell your Timex product e.g.:
TS 1500 Buy @ $20.25 - Sell @$27.00

Thos. Woods
PO Box 64
Jefferson, N.H. 03583

Profile 2068 - Tom Bent's improved ZX81 ROM, & other hardware & software.

Curry Computer
5344 West Baniff
Glendale, Az

TS 2068/1000 & Spectrum Products - Large Selection

English Micro Connection
15 Kilburn Ct.
Newport, RI 02840

Spectrum Products at very good Prices - no Plastic.

Quick Silva - 2068
Knighted Computers
702 Highland Street
Fulton, N.Y. 13069

Games - 2068 - 315-593-8219

D. Lipinski Software
2737 Susquahana Road
Roslyn, Pa 19001

A software buyers Guide - $20.00 - Covers All TS vendors in the US.

Sunset Electronics
2254 Taraval Street
San Francisco, CA 94116

(415)-665-8330 Virtually a Complete stock of hdwr & Software. List prices or below
Takes plastic

National Software Library
42 Harefield Avenue
Chearm Surrey SM 27NE
Great Britian

Membership $ £3.00
See Steve Tibbles letter

Long Island Sinclair Timex Group

We have received catalogs from most US and some U.K. Vendors of hardware and Software. Check the library for our catalog file. Ask too about the "junk mail" catalogs if you're interested in items for other computers (e.g., we just received one for the TI99 computer which seems to have good prices)

D. LIPINSKI SOFTWARE ALPHABETICAL INDEX OF NORTH AMERICAN SUPPLIERS 12/01/84

A & J Microdrive, 1050 E Duane Ave, Suite I, Sunnyvale, CA, 94086
Aardvark, 2352 S Commerce, Walled Lake, MI, 48088
AB Engineering, 11096 Clair, Hartland, MI, 48029 *
Ace Software, 2 E. Oak, Moorestown, NJ, 08057 *
Ack-Ack Enterprises, 12824 Claxton Drive, Laurel, MD, 20708 *
Addison Westley Publishing Co, Jacob Way, Reading, MA, 01867 *
Parvulesch Adrian, 31-20 54th Street, Suite 1D, Queens, Ny, 11377
AFR Software, 1605 Penn Ave #204, Miami Beach, FL, 33139
Aerco, Box 18093, Austin, TX, 78760 *
Alexeff Engineering, 2790 Turnpike, Oak Ridge, TN, 37830 *
Alpha Electronics, PO Box 1088, Alpha, NJ, 08865 *
Anchor Automation, 6913 Val Jaen Avenue, Van Nuys, CA, 91405
Apropos Technology, 1071-A Avenida Acaso, Camarillo, CA, 93010 *
ariZoftX, 6501 East Monterosa Street, Scottsdale, AZ, 85251 *
Audiograph Co, 3584 Leroy, Ann Arbor, MI, 48103
Audio Vision, 1279 N Normandie, Los Angeles, CA, 90027
I. Auersbacher, 41 King Street, Belleville, NJ, 07109 *
Banta Software, 6008 Highwood Way, Orangevale, CA, 95662 *
Bantam Books, 666 5th Ave, New York, NY, 10103
Barlog Software, 401 N Geyer Rd, Kirkwood, MO, 63122
Basic, 3705 Biscayne Blvd, Miami, FL, 33137
Basically Programming, 2528 W. Olive Avenue, Fullerton, CA, 92633 *
Andre Baune, 304 Scott, Chateauguay, Quebec, Canada J6J 4H5
Jerry Bennett Software, 143 Carling Ct, San Jose, CA, 95111 *
Biocal Software, 340 Cypress Drive, Fairfax, CA, 94930
Birkhauser Boston, Inc, 380 Green St, Cambridge, MA, 02139
The Boston Computer Society, Three Center Plaza, Boston, MA, 02108
Robert J. Brady Co, Bowie, MD, 20715
Brainchild Computer Works, POB 506, Pewaukee, WI, 53072
Russell Brewer, 26630 Mill Rd, Frazeysburg, OH, 43822 *
Brooklyn Closeout Corp., 167 Clymer Street, Brooklyn, NY, 11211 *
E. Arthur Brown Company, 3404 Pawnee Drive, Alexandria, MN, 56308 *
Budget Robotics & Computing, PO Box 18616, Tucson, AZ, 85731
Busyness, POB 421773, San Francisco, CA, 94101
Byte-Back Co, Rt 3, Box 147 Brodie Rd, Leesville, SC, 29070
Bytes & Pieces, 550 N 68th St., Wauwatosa, WI, 53213
C & A Distributors, 4701 N.W. Linden Road, Kansas City, MO, 64151
Rod Callahan, Rt 1, Box 56, Miami, OK, 74354 *
Ken Carpenter KC4UG, Box 506, Vernon, AL, 35592
Chipmunk Software, 634 Littlecroft Road, Upper Darby, PA, 19082 *
Christian Software, Box 547 - St. Rt. 590, Bettsville, OH, 44815 *
Cinagro Software, 155 7th St., Rochester, NY, 14609
Jim Clatfelter, 646 Corwin Ave, Glendale, CA, 91206 *
Compusa Corporation, 1101 Bristol Rd, Mountainside, NJ, 07092 *
CompuSoft Publishing, Inc., 535 Broadway, El Cajon, CA, 92021 *
Computer Continuum, 301 16th Avenue, San Francisco, CA, 94112 *
Computer Shopper, PO Box F, 407 S. Washington Ave., Titusville, FL, 32796
The Computer Trader, POB 20976, San Diego, CA, 92120
Computer Ware Publishing, 92 Ruskin St., Ottawa, Ontario, Canada K1Y 4B2 *
Computer-Ware Software, POB 1059, Riverdale, NY, 10471
Cottage Technology, 5720 W Little York, Suite 170, Houston, TX, 77091 *
Creative Computing Press, 39 E Hanover Ave, Morris Plains, NJ, 07950
Crypt, 303 Meadowlark Lane, Durant, OK, 74701 *
Crystal Coast Software, POB 233, Morehead City, NC, 28557
C-Tech, PO Box 38553 #170, Houston, TX, 77238
Curry Computer, 5344 W Banff, Glendale, AZ, 85306 *
C. W. Associates, Department L, 419 N Johnson St, Ada, OH, 45810 *
DAK Industries, 10845 Vanowen Street, N. Hollywood, CA, 91605
Datacon, PO Box 775, Kernersville, NC, 27284
Developement Associates, 1520 South Lyon Street, Santa Ana, CA, 92705 *
Developement Engineering Laboratory, 13512 Keating St., Rockville, MD, 20853 *
Delphic Enterprises, PO Box 72205, Corpus Christi, TX, 78472 *
Jack Deuber Software, PO Box 305, Casselberry, FL, 32707 *
Doug Dewey, 206 James St, Carrboro, NC, 27510
DHS, POB 681, Orland, CA, 95963
dilithium Press, 8285 SW Nimbus, Suite 151, Beaverton, OR, 97005 *
Discount Software, 320 E 58th St, New York, NY, 10022
Doc's Software, 4339 Keysville Ave, Spring Hill, FL, 33526
Dokay Computer Products, 2100 De La Cruz Blvd., Santa Clara, CA, 95050
C. Dos-Santos, PO Box 9521, Fountain Valley, CA, 92728 *
Down East Computer, PO Box 3096, Greenville, NC, 27834 *
Dynamic Designs, PO Box 872, Norco, CA, 91760 *
Electronic Techonology Today Inc., PO Box 240, Massapequa Park, NY, 11362 *
ENER-Z Company, PO Box 635, Fort Washington, PA, 19034 *
Executive Workshop, 7420 S E Woodstock Blvd, Portland, OR, 97206
E-Z Key, Suite 75 A, 711 Southern Artery, Quincy, MA, 02169 *
Ezra Group II, PO Box 5222, San Diego, CA, 92105 *
Farside Creations, 543 Iroquois Trail, Carol Stream, IL, 60188 *
Bob Fingerle, 39039 Embarcadero Terr., Fremont, CA, 94536
Charles T. Fischer, 75 Dunfries Terrace, San Rafael, CA, 94901 *
Marydel Frohne, 601 N. Highway 83, Bensenville, IL, 60106 *
Games to Learn By, 2 South St, Box 575, Williamsburg, MA, 01096
Ganhart/EARThings, 115 N Rocky River Dr, Berea, OH, 44017
Blaine Geddes, M-1278 Mount Allison University, Sackville, N.B., Canada E0A 3C0 *
General Systems Consulting, 2312 Rolling Rock Dr, Conley, GA, 30027
Gesang Associates, POB 452, Randallstown, MD, 21133
Herman Geschwind, 1714 Claredon Dr, Greensboro, NC, 27410
Gibson Data Services, 9 Orchard Drive, Durham, NH, 03824
Gladstone Electronics, 90 Furhmann Blvd, Buffalo, NY, 14203
Granada Publishing, 515 Madison Ave, New York, NY, 10022
The Great Am. Software Exchange, Dept CS, POB 1548, Springfield, VA, 22151
Wayne Green Books, 80 Pine Street, Peterborough, NH, 03458 *
Group Technology LTD, POB 87, Check, VA, 24072
L Harmon, 4909 Clearlake Dr, Metairie, LA, 70002
Hawg Wild Software, PO Box 7668, Little Rock, AR, 72217 *
Heath Computer Services, 950 East 52 South, Greentown, IN, 46936
Dave Hebert's Computer Classifieds, PO Box 344, Leola, PA, 17540
Heller Paper Co, 2123 E 38th St, Brooklyn, NY, 11234
Hobby Robot Co, POB 887, Hazlehurst, GA, 31539
Home Doctor Software, 1445 Oldfield Road, Decatur, GA, 30030
Hunter Electronics, 1630 Forest Hills Drive, Okemos, MI, 48864 *
Hybridos, 614 Linden Hill, Lindenwold, NJ, 08021 *
I. R. S. Enterprises, Box 4503, Lancaster, CA, 935394503 *
Independence Research, POB 1497, Orem, UT, 84057
Integrated Data Systems, 11 Brighton Ave, Toronto, Ontario, Canada M4M 1P3
Interface Innovations Inc., 4372 Casa Brazilia Suite 201, St. Louis, MO, 63129 *
JDR Microdivices, 1224 S. Bascom Ave., San Jose, CA, 95128
JK Audio, PO Box 3296, Escondido, CA, 92025
J R Software, 1052 Appleford Street, Gloucester, Ontario, Canada K1J 6T4 *
JPR Software, PO Box 4155, Winter Park, FL, 32793 *
JRC Software, John Richard Coffey, PO Box 448, Scottsburg, IN, 47170 *
K.D.W.J.E. Publishers, PO Box 6730, Chicago, IL, 60680 *
J. C. Kilday Associates, Central Avenue, Peaks Island, ME, 04108
JF Kinsurough, 723 Rosella Ave, Floor 2, Akron, OH, 44307
Knighted Computers, 707 Highland St., Fulton, NY, 13069 *
Arnold Konder, 2 Jane Street, New York, NY, 10014
Ksoft, 845 Wilmer Rd., Yorkville, IL, 60560

K-2 Electronics, 3090 Varisty Dr, Ann Arbor, MI, 48104
John Kuhn, 1707 King St., Jacksonville, FL, 32204 *
Virginia T. Lake, POB 551, Hockessin, DE, 19707
L & G Enterprises, PO Box 6354, Silver Spring, MD, 20906-0354 *
D. Lipinski Software, 2737 Susquehanna Road, Roslyn, PA, 19001 *
Luxtron Inc., 241 Winter Street, Haverhill, MA, 01830
Magic World Software, PO Box 1124, Olympia, WA, 98507 *
Maranatha, POB 759, Mableton, GA, 30059
Markel Software, POB 2392, Secaucus, NJ, 07094-0992
Maryland Book Exchange, 4500 College Avenue, College Park, MD, 20740
Mech. Design Analysis, 1235 Madero Street, Dubuque, IA, 52001
Micro-Load, PO Box 1095, Truth or Consequences, NM, 87901 *
MicroSync, 60 Foundry St., Keene, NH, 03431 *
Midwest Software Co., 9922 Harwich Dr., Crestwood, MO, 63126 *
Mill Research, 32749 Avalon Crescent, Abbotsford, BC, Canada V2T 3M5
Robert C. Moler, 5990 Secor Rd., Traverse City, MI, 49684 *
Monixware, PO Box 310, MFLD, NJ, 07435
Mountianeer Software, 115 North 7 Avenue, Paden City, WV, 26159
R. Nelb, 30 Whitney Ridge, Hamden, CT, 06518
Nelco Pacific, PO Box 282, Edmonds, WA, 98020 *
Occam Research Inc., Box 1056, Trumansburg, NY, 14886 *
The John Oliger Co., 1101 Whidbey Dr., Cumberland, IN, 46229 *
Orange Coast Software Corp., PO Box 951, Midway City, CA, 92655
Orion Computers, Rt. 2, Box 310, Louisville, TN, 37777
Orion's Belt Enterprises, 807 N Fairway Rd, Glenside, PA, 19038 *
Pacific Information Inc., 11664 Ventura Boulevard, Suite 295, Studio City, CA, 91604 *
Peech II Productions, 6333 Parkman Pl., Cincinnati, OH, 45213
Pheonix Enterprises, 1750 N DuPont Hwy., No. 17, Dover, DE, 19901 *
Pion Software Co., 541 Fairlawn Avenue, Toronto, Ontario, Canada M5M 1V5
Pleasanttrees Programming, PO Box 7345, Mesa, AZ, 85206
Poretsky & Poretsky Inc, 521 Argyle, Brooklyn, NY, 11218
Practical Programs, Inc., PO Box 93104, Milwaukee, WI, 53203 *
Krain D Pritts KA2LMO, 3421 Oneida St., Chadwicks, NY, 13319 *
Pyramid Electronics, 2174 Gulf Gate Dr, Sarasota, FL, 33581
Quicksilva Inc., 426 W. Nakoma, San Antonio, TX, 78216 *
QZX, c/o Alex Burr, KSXY, 2025 O'Donnell Dr., Las Cruces, NM, 88003 *
RAH, 4739 N Milwaukee Ave, Chicago, IL, 60630 *
Ramex, 48945 Van Dyke, Utica, MI, 48087 *
Red Balloon Software, Pilcher Ecosystems, Inc, E. 17014 Madison Rd., Mead, WA, 99021 *
Rheesware, 4001 Pennwood 23, Las Vegas, NV, 86102
R.I.S.T. Inc, POB 499, Fort Hamilton Sta., Brooklyn, NY, 11209
Robotec, 59 C St., Airpoint Ind Park, Perrysburg, OH, 43551
Rombak Inc., 1525 Aviation Blvd, Suite A111, Redondo Beach, CA, 90278
Russell Electronics, RD 1 Box 539, Centre Hall, PA, 16828 *
Howard W. Sams, 4300 W 62nd St, Indianoplis, IN, 46268
S & S Company, 308 N Lake St, Addison, IL, 60101
SCOF, Inc., PO Box 5021, 733 Concord, Richmond, KY, 40475 *
Second Base, 700 Lexington Avenue, Altoona, PA, 16601
Paul F. Seymour, P.E., PO Box 11, Hamburg, NJ, 07419
Sharp's, 127 Nine Mile Rd., Sandston, VA, 23150 *
Sheridan House Inc., 145 Palisade Street, Dobbs Ferry, NY, 10522 *
Edward Sidorski, PO Box 342, Susquehanna, PA, 18847
Sinclair Research Ltd., 50 Staniford Street, Boston, MA, 02114
Simplex Software, POB 792, New Brunswick, NJ, 08903
Simulation, PO Box 2332, La Jolla, CA, 92038 *
Sincus News, PO Box 523, Owego, NY, 13827 *
Simware, POB 2032, Santa Fe, NM, 87504
SiriusWare, 5 Turning Mill Road, Lexington, MA, 02173 *
Skinner Electronics, PO Box 787, Fallbrook, CA, 92028
SmallType Software, 519 Independence Ave. SE, Washington, DC, 20003
Xendric Smith, 527 Mears Ct., Stanford, CA, 94305
Softgems, PO Box 119, Mayville, NY, 14757 *
Soft Magic Corporation, 1211 W. High Street, Bryan, OH, 43506 *
Softwark Associates, 191 Munro St., Toronto, Ontario, Canada M4M 2B8 *
Softmark Associates, 216 Fifth Avenue, New York, NY, 10010 *
Softsync Inc, 14 E 34th St, New York, NY, 10016
Software Solutions, 527 Mears Court, Stanford, CA, 94305 *
Soft-Key, 3300 Midway Dr., Dept 124, San Diego, CA, 92110 *
Sourceware Inc, POB 1579, Dept SI-1, Vernal, UT, 84078
Speedware, PO Box 19120, Austin, TX, 78760
David Spollman, PO Box 2290, Provo, UT, 84603 *
Sphaler Software Systems, Nine Springbrook Circle, Sacramento, CA, 95831 *
Story Software, 3732 S 27th Street, Milwaukee, WI, 53221
Sturdivant Laboratories, Box 116, Bedford, IN, 47421 *
Sum-Ware, 810 Lamont Road, Albion, NY, 14411 *
Sunset Electronics, 2254 Taraval, San Francisco, CA, 94116
Sybex Computer Books, 2344 Sixth Street, Berkeley, CA, 94710 *
Sync-Abstracts, PO Box 313, Mason, MI, 48854 *
SyncWare News, PO Box 64, Jefferson, NH, 03583 *
Syntax, The Harvard Group, RD 2, Box 457, Harvard, MA, 01451
Tac Software, PO Box [illegible], [illegible], CT, [illegible] *
Tapecom Inc., 45 Jefferson St., Stamford, CT, 06902 *
Technology Products and, Services Inc., PO Box 1230, West Plam Beach, FL, 33402-1230 *
TCJ Computer Products, 859 N Virgil Ave, Los Angeles, CA, 90029
C. Vernon Tidwell, P.E., 1303 Whitehead St., Key West, FL, 33040 *
Time Designs Magazine, 29722 Hult Road, Colton, OR, 97017 *
Timensa Software, 3707 Downey Dale Dr, Randallstown, MD, 21133
Timelinez, PO Box 1312, Pacifica, CA, 94044
Toco Technology, POB 98, Santa Claus, IN, 47579
Toronto Software World, PO Box 34, Agincourt, Ontario, Canada M1S 3B4 *
Triangle Sinclair User Group, Doug Dewey, 206 James St, Carrboro, NC, 27150
T-S Horizons, 2002 Summit St, Portsmouth, OH, 45662
T.S. Services, PO Box 15214, Red Bank, TN, 37415 *
TSUG, c/o Douglass Dewey, 206 James St, Carrboro, NC, 27510
21st Century Electronics, 6813 Polk Street, Guttenberg, NJ, 07093 *
2-Bit Software, PO Box 2036, Del Mar, CA, 92014 *
UAS, PO Box 612, Haddonfield, NJ, 08033 *
Val Corporation, 1621 N. Wakefield Street, Arlington, VA, 22207
Votrax Inc., 1394 Rankin, Troy, MI, 48083
Harvey Wasserman, 4604 Apple Tree Dr., Alexandria, VA, 22310
Al White, 308 18 1/2 Avenue SW, Rochester, MN, 55902
White Lightning, Rte 4, Box 2260, Lufkin, TX, 75901
WHW Software, PO Box 5223, Roanoke, VA, 24012 *
Widjup Co., 1120 Merrifoeld SE, Grand Rapids, MI, 49507
Wizard Works, PO Box 66, Walkerville, MI, 49459
WMJ Data Systems, 4 Butterfly Drive, Hauppauge, NY, 11788 *
Tom Woods, PO Box 64, Jefferson, NH, 03583
Zebra Systems Inc, 78-06 Jamaica Ave, Woodhaven, NY, 11421
ZX-Panding, Ltd., PO Box 25, Newton, NC, 28658

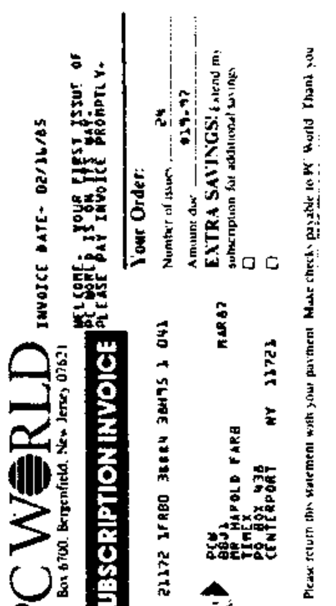
NOTE: * Designates that those suppliers are listed in the DLS Buyers Guide and we have written confirmation that they are still going to support the Timex and Sinclair computers. The remain[ing] have advertised or have had their name mentioned in a publication as still supporting the compu[ters]. We also know of over 300 other possible suppliers, but we have not been able to confirm that the[y] are still suporting the computers. We hope to have this information for the update of the guid[e].

D. LIPINSKI SOFTWARE BUYERS GUIDE TO SINCLAIR - TIMEX PRODUCTS & SERVICES is now available. $20.⁰⁰

D LIPINSKI SOFTWARE
2737 Susquehanna Road
Roslyn, PA. 19001 USA

LETTERS TO LIST

Harold Farb, Who are you!



This is not that funny. Please refrain from this type of activity.

Wes Brzozowski
337 Janice St.
Endicott, NY 13760
March 10, 1985

Mr. Pashtoon,

This is just a little note to tell you that I've appreciated your articles in the L.I.S.T. newsletter and in SYNTAX. The latest L.I.S.T. newsletter suggests that John Oliger "took you to task" because of the microdrive interfacing techniques you've used. I hope this will not discourage you from continuing the work you've been doing. It's very helpful and very important.

Although I agree with some of the points Mister Oliger seems to have made, it's far more significant that you've achieved success. Because of that success, others will be encouraged to spend the not insignificant amount of money needed to try for themselves. I've designed & built my own interface, for example, but would never have tried except for the kind of news you presented in your articles. (It's all very nice to be a pioneer, but I personally needed some assurance that the problem could be solved before I'd shell out 125 bucks.) After I did get started, the L.I.S.T. newsletters with your articles were never far away; they were highly valuable in getting my design to work.

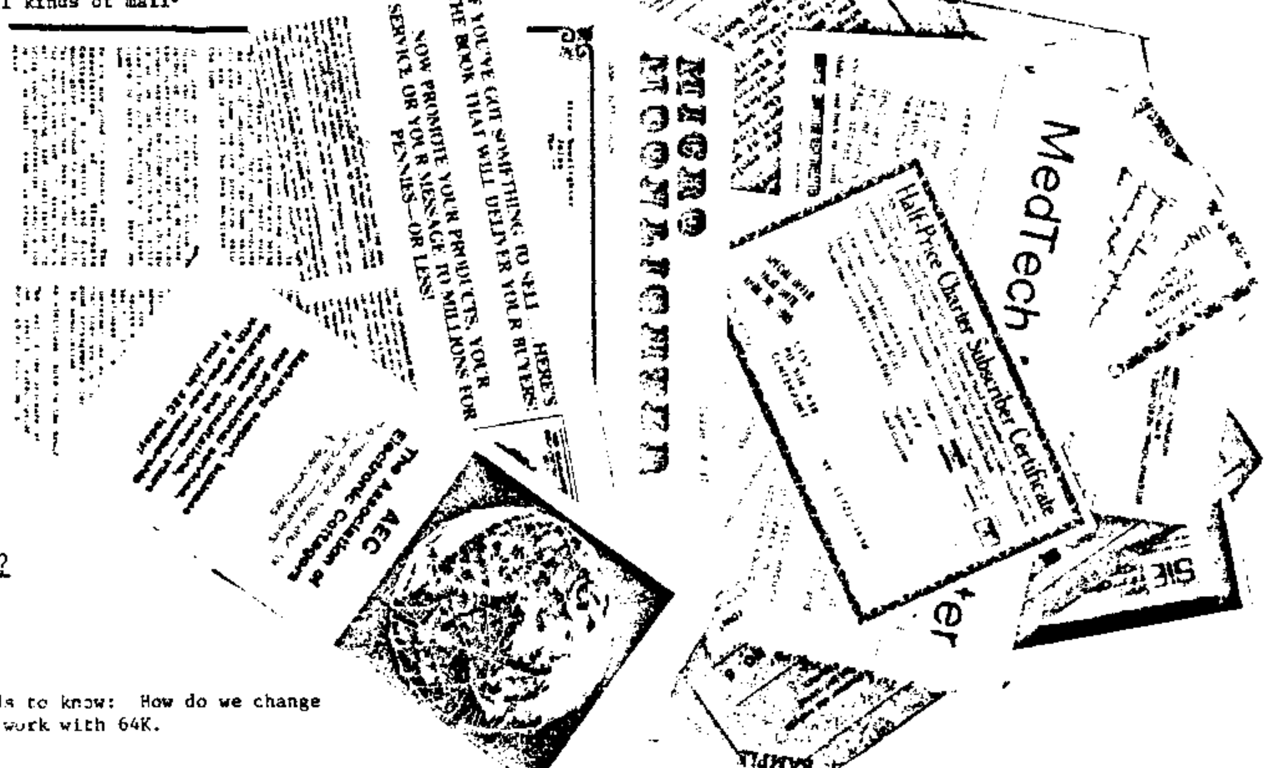
Looking at the "big picture", I'm sure that your articles will have catalyzed a cycle of design projects from which more and more versatile microdrive interfaces will evolve. I have hopes that my design might be the next step, (but by no means the last!) but for that, we'll just have to wait and see. My write up will appear in the March Sincus News, which your group receives from us. If you've got a spare moment to look it over, I'd be very pleased to hear your comments or suggestions. In any case, I hope it might be of some use to you, after all the help you've unknowingly given me.

Thanks so much & keep up the good work!

Sincerely,

Wes Brzozowski

We get all kinds of mail.



MEMBERS ASK?

Ed Wheeler needs to know: How do we change "Organizer" to work with 64K.

R. Niewenhoff - as far as I know, Memotech is still in business

LETTERS

ZX81's OK!

I'm a long-time admirer of the enthusiastic and talented work of those who contribute to putting **Radio-Electronics** in my mailbox each month. More recently, I have subscribed to and read **ComputerDigest** to that directory of good company.

It is with that truthfully said, and with the hope that the truth will help set one free, but get the point to me next paragraph, I would like to offer a comment or two on Mark Latham's comments contained in his wormwhine article, "Machine code Improvement System" in the January issue.

Mr. Latham commented in the second paragraph of his article that the lack of speed (in loading and running programs) really prevents the *ZX81* and/or the Timex Sinclair *1000* from serving any useful purpose.

First, may I say that he and I are, apparently, of one mind in our desire to find useful purposes for the ZX81. It seems to possess great speed and capability. We diverge, however, at the point of the programming ability in terms of speed.

The text characters being manipulated to produce them in acceptable written form and send them on to you are being done in BASIC and at a speed which is comparable with that which I can get on paper with the IBM in the closet, and with less effort.

Once "finalized," it goes to a Gemini printer at 4600 baud via a Byte-Back RS-232 Serial device, at a speed that is very fast.

I have a quarterly federal and state estimated tax program jammed within the perimeters of VU-CALC, which allows me to perform that chore four times yearly in at least a twentieth of the time it would take me without it, and, from what I'm able to read, the expensive machines could not really do it substantially quicker.

I therefore find that the *ZX81*, despite the negative comments by both friends and non-friends, as to running speed, do not correspond to my own experience. Further, when one weighs the cost vs utility factor, there simply is no contest for home use.

As to loading. The approximately 300-baud loading speed is a tad slow for most programs. However, for a modest sum, fast loading programs and devices are available and in constant use by many of us who spend much time at the *ZX81*.

Recently, I was amazed to read, I think, the article was by Mr. Freedman, in another publication, that it took him 72 seconds to disk-load CP/M to, I presume, one of those more costly machines. Honesty and excuse my naivete, from the many, many articles I had read to that time, I believed that a "slow" disc loading took 10 seconds while the fast one probably took 5 seconds.

My amazement changed rather quickly to smugness as I realized that I have been loading three-16 programs back-to-back, accessible to each other and run-able (48K's worth) in 76 seconds flat (and that's with a $23.00 cassette recorder and an under-$1.00 data cassette tape).

In conclusion, I wish to say that the *ZX81* is not as slow running as many say and for one-one-hundredth the cost of a disc drive, is not slow loading either.

J.E. JUERGENS, *Pacific, CA*

Dear P&B,

I thought I would sit down and give you what info I have on the programs and such for the SPECTRUM. As far as being able to travel to England, that is pretty well out. As of this writing, I have 83 days left in Europe, and then me and Uncle Sam are going our separate ways. However, I can give a little help on getting hold of some programs (all categories).

Since it sounds like at least a few of you subscribe to YOUR COMPUTER magazine, you might have noticed the adds for the different rental (or HIRE) organizations. I sent inquiries to the three that were listed. I recieved an answer from two of them. One was the german branch of the organization, and their literature was in german. They had only a few titles available. The other was the National Software Library. The membership fee was only a mere £3.00 for life. They presently boast a library of 440 different titles and a membership of approximately 4000 SPECTRUM owners.

Their prices (for a multiple tape order) start at just 63p per tape, plus postage, packing and value Added Tax. There are two methods of ordering. The cheapest is to give a choice of 4 titles for each tape you wish to rent, cost as follows:

1 tape 70p+34p P&P + 16p VAT TOTAL £1.20
2 tapes £1.30 (65p ea) + 60p P&P + 42p VAT TOTAL £2.20
3 tapes £1.89 (63p ea) + 89p P&P + 42p VAT TOTAL £3.20

If you choose a single title for each tape they give your order preferential treatment and will despatch single tapes (if all the tapes you've picked are not immediately available. (This can involve a lot of extra work, maintaining waiting lists etc). The costs are as follows:

1 tape 88p + 34p P&P + 18p VAT TOTAL £1.40
2 tapes £1.57 (78.5p ea) + 68p P&P + 33p VAT TOTAL £2.50
3 tapes £2.15 (72p ea) + 89p P&P + 46p VAT TOTAL £3.50

Tapes are also available for purchase. They are sold at less than the suggested retail price. If you wish to purchase the tapes that you have rented, you can deduct another pound from the price. There are several tapes which they cannot rent out do sell at a discounted price.

Occasionally, they will clear old tapes or tapes of which they have an abundance. These will sell from £1.00 to £4.00 apiece. (Yes that copy of TIMEGATE that we spent $24.00 on is being sold for £2.00, and PSION's FLIGHT SIMULATION for £3.50).

Not all titles are available from them, but a good number are and it is well worth the £3.00 investment. There is also an added postal charge for those living outside the U.K. Add 50p per tape towards postage. In the USA payment is in cash (sterling) or International Money Order drawn in Sterling.

The reason for the requirement of payment in Sterling is that their bank charges £2.00 for each check drawn on foreign currency.

The address is:

National Software Library
42 Harefield Avenue
Cheam, Surry SM2 7NE
Great Britain

I'm sure they would appreciate the business and you will appreciate the availability of software.

Steve Tibbles

I am a member Steve. And yes NSL is a good organization. Note however, that mail from U.K. has recently gone to pot. Deliveries have gone from 10 days to 6 weeks, even from NSL.

Dear T.I.S.U.:

My name is Everett Talavera and I'm the leader of the recently born MEXICO CITY'S TIMEX SINCLAIR USERS GROUP". Weeks ago, owner Timex Info Bear Inc Adriana Rodrigues knew about you thru Pleasantress and wrote to you. We have received your newsletter; we thanks you for write back very fast, that demonstrates that you realy want to help us.

Our TSUG was born only about 3 month ago. We have contact with a good number of companies that support T/S.

I have a few questions, request and advises, could you help me ?

At Curry Computer
5344 West Tariff Lane
Glen Dale, AZ 85306

I saw the Hardware Dot Matrix Printer, at the the increasable price of 29.95 + 3.95 S/H, know it's very small - width 1 3/4" and that it print only 16 char/se. per line. I thought the price was worth . If you know how good it is, please let me know.

About your spectrum Rom, I'd like to know what's the % of compatibility with spectrum software and how much would it cost to send to Mex. Do you know where can I get the T S 2068 BIT MAP ? There are rumors about that SINCLAIR comes to Mexico, could you check it out?

As you know, our TSUG is just starting and I'd like some help to organise and print a newsletter for them (be cause lots of them don't talk English). And the biggest favor, INFO in Mexico is zero and Mexican there have very little software, so please, could you tell to each and every member of your group that we send an SOS for our program library that's very limited. We don't care the programs also or the type; we will be so greatfull be find on our mail box programs donated from your kind members. I promise to pay back their postage.

About the subscribtion to your newsletter, I'd like to send my subscription and in 3 pays, 5, 5 and 5, why in 3 pays? Because mexican post office are could find my money and at least or 5 to me will arrived. So just say O.K. to send money (after each pay, that you received my check please let me know). I've enclosed 3 dollars for two issues, January - and March, please send them.

All, I think I have asked too much, but I love T/S computers and I want to help my brothers T/S users in Mexico.

Please help us on our requests, and write back soon! all our members will be counting every day!

Sincerely,

Everett T.
The T S lover.

P.S. Any old and ugly book or anything about T S computers, will help us more than you think !
Thanks a lot.

Everett T.

Your two issues of LISTing have been sent. Glad to have you aboard. If you don't have a printer, at all, the mindware will work for the TS1000. It is not the best, not even as good as the Timex (Alphacom) printer. Still, the price is reasonable.

Spectrum compatibility is 95 to 99%, see Doug Dewey's list. The ROMS are $18.00 to LIST members, $19.95 otherwise. You would need to send an international money order in $US, to LIST Associates (address in the newsletter.)

I hope this is some help. We'll be publishing your letter in LISTing next month. Hope you get some favorable responses.

Your payment scheme is unusual, but understandable. We'll try to comply with your request.

Very truly yours,

Paul Donnelly

Paul Donnelly
Long Island Sinclair Timex Group
[illegible]
Smithtown, NY 11787-0438
U.S.A.

LONG ISLAND SINCLAIR TIMEX

Vincent Yurgen is trying to drive a Selectric from his ZX81. Has anybody bought the adaptor kit?

DECEMBER 15 1984

CENTERPORT NY 11721

DEAR MR DONNELLY:

MANY THANKS FOR INCLUDING ME IN YOUR SOFTWARE EXCHANGE PROGRAM. I THINK IT IS AN EXCELLENT IDEA FOR COMMUNICATION AMONGST THE MEMBERS.

I DO NOT HAVE, NOR DO I INTEND TO PURCHASE A TS2068. MY MAIN SYSTEM HERE IS A TS1000, AND I WOULD VERY MUCH LIKE TO RECEIVE ZX81 OR TS1000 TAPES ONLY.

THE PROGRAM THAT I HAVE CHOSEN TO SUBMIT IS A MODIFICATION TO AN INTERESTING ONE THAT WAS PUBLISHED IN SYNTAX FOR THE ZX80 COMPUTER. I ENJOYED IT SO MUCH THAT I CONVERTED IT TO RUN ON A ZX81 OR TS1000. I HOPE YOU AND THE OTHER MEMBERS FIND IT HELPFUL.

BY THE WAY, THERE ARE TWO ERRORS IN THE "BYTE MOVIE" PROGRAM. LINE 50 SHOULD READ: CHR$ 128+CHR$ 32+CHR$ 128. LINE 60 SHOULD READ: CHR$ 128+"(ONE SPACE)"+CHR$ 128.

IF YOU CAN SPARE A FEW MOMENTS TO DROP ME A LINE AND EXPLAIN WHY MY LAST COPY OF LIST HAD BROWN PAPER GLUED ALL OVER IT, I WOULD GREATLY APPRECIATE IT. ALSO, YOU MIGHT ADVISE ME IF YOU OR ANY ONE ELSE IN THE CLUB IS KNOWLEDGEABLE ABOUT Z80 MACHINE CODE AS IT RELATES TO THE ZX81 OR TS1000. I HAVE AN EXCELLENT PROGRAM WHICH I AM UNABLE TO GET WORKING CORRECTLY BECAUSE OF AN ERROR OR ERRORS IN THE MC KEYBOARD INPUT CODE. AND I WOULD APPRECIATE ANY HELP THAT YOU OR YOUR MEMBERS CAN OFFER. THANK YOU.

SINCERELY,

JOHN A SAMPSON
23-51 123 sTREET
COLLEGE POINT NY 11356

3-7-85

Dear LIST:

I've read that some of your group members have successfully dealt with British firms. I understand that they will take Visa or MC. Can you recommend one or two and a British Sinclair User's group? Are any of the British firms discounters or wholesalers?

The reason I'm inquiring is due to the article in nov. 84 Byte p.416 on the PSION ORGANISER. It may be possible to use this as an Eprom programmer for Timex 2068 cartridges. They have (PSION has) a USA distributor and a nice brochure: PSION INC.
40 Lindeman DR.
(203)371-4371 Trumbull, CT 0651

Their prices here are quite a bit higher than in the Byte article. You're probably aware that Psion wrote the software for the QL.

Thanks for the help. Sincerely your
Chuck Trier

Spokane, WA 99216

List Group

14

Paul Donnelly
LIST User Group
PO Box 438
Centerport, NY
11721-0438

Timothy R. Russell
912 Kingsley Circle
Thousand Oaks, CA
91360

Dear Paul,

I read your note in the latest SyncHare News concerning a possible TS-2068 to ZX-Spectrum bus conversion standard with a great deal of interest. The subject has been on my mind as well, and I have some general comments on the subject, as well as a description of the converter that I have built. It is, as yet, not fully tested, but I will keep you posted on the results.

Most of the 2068 signals have identical, or unbuffered but otherwise identical, counterparts on the Spectrum bus. Direct wiring is possible here, either with or without additional buffering. In addition, the following signals have no Spectrum counterparts, and may be left unconnected: SPKR/TAPE, EAR, A7RB, DZ_IN, DZ_OUT, EXROM-NOT, ROSCS-NOT, BUS_ISD, IOAS, and SOUND.

There is only one Spectrum signal which has no counterpart or use in the 2068. This is the IORQGE-NOT signal, which is used in the Spectrum for fully decoding the lower 128 I/O ports, which is already done internally in the 2068. Therefore, IORQGE-NOT can also be left unconnected.

I do not believe that there should be too much concern about the video signals normally present on the Spectrum bus, as any video interfacing should really be done before the bus conversion. In the interest of some conformity, however, I suggest that the R-G-B signals be provided at the Spectrum pins that normally carry the V-T-U signals. My connections for these signals on my prototype were made using miniature coaxial cable, as was the connection for the composite VIDEO signal.

The most important decision for a standard conversion is that concerning the Spectrum's ROMCS-NOT signal. This signal can be emulated for the 2068 by inverting ROMCS-NOT, and ORing it with address lines A14 and A15. The resulting signal should be applied to EE-NOT. This will turn off the 2068's internal memories whenever ROMCS-NOT is pulled high, and A14 and A15 are low.

Most peripheral devices create their own voltage supplies, either from a separate input entirely, or from the main voltage on the bus. For the Spectrum, the main voltage is +9VDC. The 2068 on the other hand, supplies +15VDC on the bus. Rather than simply connecting the +15VDC directly to the "+9VDC" pin on the Spectrum bus (and maybe risk blowing up an internal circuit on some peripheral device), I chose to use a voltage regulator that is capable of dissapating a fair amount of power. An LM317T with a good heat sink is capable of supplying the required voltage at well over an ampere current drain. The other voltages present on the Spectrum bus are really just bias supplies, not capable of supplying much current at all, and I recreated them more just for accuracy than out of any expected use. Of special note, however, is the -12VDC supply, which is not actually present on the Spectrum bus at all. In real life, the pin marked "-12VDC" is connected to the unrectified and unregulated 12V from the circuit which provides the +12VDC.

My voltage converter circuits were designed to be as simple as possible and yet still work. Both negative voltages are derived from an oscillator/rectifier circuit, with a zener regulator for -12VDC and an IC regulator for the -5VDC. The +12VDC uses only a zener regulator down from the +15VDC.

Although not yet fully tested, I believe that this converter will provide any Spectrum peripheral with all the neccessary signals. Any comments or notes from your user group would be highly appreciated.

Sincerely yours,

P.S. I have made a late change in the decoding for ROMCS. I am including the MREQB signal in the OR-ing configuration, for a better, more complete decode. You'll see this from the schematic.

Campbell Center
For Historic Preservation Studies
P.O. Box 66 Mount Carroll, IL 61053
815-244-1173

Gentlemen:

I know that your users' group is small, but I also know that Sinclair-Timex users often delight in modifying and improving their equipment to do anything. And let me tell you, the museum field needs something.

We are short, cruelly short, of people who can apply computers to museums. That is the reason we offer classes to museums and computer professionals. The best source for help to museums, particularly smaller museums, are people who can apply small computers to just about any problem. That is what made me think about the Sinclair-Timex group.

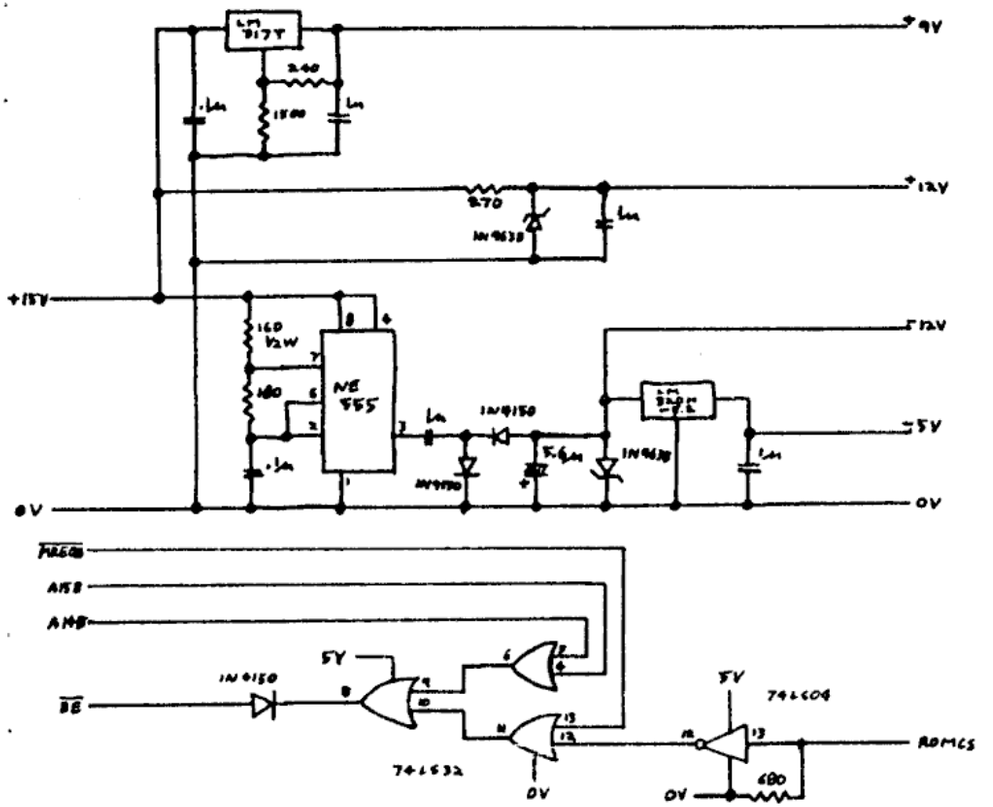
I haven't put anything in the release about Timex-Sinclair. But I would be very pleased if some of your members attended. Please include information about the course and the opportunity in representa, in your next newsletter.

Sincerely,
Ruth Gertner
Director

We've received a complete brochure on their course, contact Paul D. if you're interested.

TS 2068

ZX SPECTRUM



All signals not pictured have are connected to the appropriate pins on both busses: A0 to A0, D7 to D7, $\overline{MREQB}$ to $\overline{MREQ}$, $\overline{RFSHB}$ to $\overline{RFSH}$, etc.

T. R. RUSSELL
03/01/1985

ZX 81; T/S 1000

B (BOTTOM)	A (TOP)	
5V	D7	1
9V	$\overline{RAMCS}$	2
SLOT →		3
0V	D0	4
0V	D1	5
$\overline{\phi}$	D2	6
A0	D6	7
A1	D5	8
A2	D3	9
A3	D4	10
A15	$\overline{INT}$	11
A14	$\overline{NMI}$	12
A13	$\overline{HALT}$	13
A12	$\overline{MREQ}$	14
A11	$\overline{IORQ}$	15
A10	$\overline{RD}$	16
A9	$\overline{WR}$	17
A8	$\overline{BUSAK}$	18
A7	$\overline{WAIT}$	19
A6	$\overline{BUSRQ}$	20
A5	$\overline{RESET}$	21
A4	$\overline{M1}$	22
$\overline{ROMCS}$	$\overline{RFSH}$	23

T/S 2068

B (BOTTOM)	A (TOP)	
0V	0V	1
SPKR/EAR	EAR	2
+15V	A7RB	3
+5V	D7	4
( )	(DZIN)	5
SLOT →		6
0V	D0	7
0V	D1	8
$\overline{\phi}$	D2	9
A0	D6	10
A1	D5	11
A2	D3	12
A3	D4	13
A15B	$\overline{INT}$	14
A14B	$\overline{NMI}$	15
A13B	$\overline{HALT}$	16
A12	$\overline{MREQB}$	17
A11	$\overline{IORQB}$	18
A10	$\overline{RDB}$	19
A9	$\overline{WRB}$	20
A8	$\overline{BUSAK}$	21
A7	$\overline{WAIT}$	22
A6	$\overline{BUSRQ}$	23
A5	$\overline{RESET}$	24
A4	$\overline{M1}$	25
(DZOUT)	$\overline{RFSHB}$	26
RED	$\overline{EXROM}$	27
GREEN	$\overline{ROSCS}$	28
BLUE	$\overline{BE}$	29
(BUS ISO)	IOAS	30
VIDEO	SOUND	31
0V	0V	32

ZX SPECTRUM

B (BOTTOM)	A (TOP)	
A14	A15	1
A12	A13	2
5V	D7	3
9V	( )	4
SLOT →		5
0V	D0	6
0V	D1	7
$\overline{\phi}$	D2	8
A0	D6	9
A1	D5	10
A2	D3	11
A3	D4	12
IORQGE	$\overline{INT}$	13
0V	$\overline{NMI}$	14
VIDEO	$\overline{HALT}$	15
Y	$\overline{MREQ}$	16
V	$\overline{IORQ}$	17
U	$\overline{RD}$	18
$\overline{BUSRQ}$	$\overline{WR}$	19
$\overline{RESET}$	-5V	20
A7	$\overline{WAIT}$	21
A6	12V	22
A5	UNREG. 12V	23
A4	$\overline{M1}$	24
$\overline{ROMCS}$	$\overline{RFSH}$	25
$\overline{BUSAK}$	A8	26
A9	A10	27
A11	( )	28

'A' side is Component side
'B' side is solder side (bottom)

Signals shown in parenthesas have no actual connections within the computer.

T.RUSSELL
02/28/85

We're printing T. Russells Letter and sketches as more food for thought.

Technical Report:

COOLING YOUR ZX 81/TS 1000

If your are looking for high reliability with continuous operation of your ZX 81/TS 1000, then this article may be for you.

POWER SUPPLY

Many articles appearing in various Timex/Sinclair related publications during the past few years have stated that within the "black box" there was excessive heat build-up, which eventually would lead to computer failure. Some of the remedies spelled out were to cut slots or drill holes in the top and bottom of the case to allow circulation of air to aid in cooling. Others suggested increasing the size (mass) of the voltage regulator heat sink to cool down the 5 volt regulator.

There is nothing wrong with any of the above ideas, however, instead of cooling the regulator and allowing the heat to escape from the computer case, why not remove the source of the heat in the first place! All it takes is removal of the 7805 voltage regulator IC and in its place use an external power supply for your computer and ram pack.

Radio Shack is currently selling a switching power supply capable of supplying +5 VDC at 1.1 amps, +12 VDC at 400 ma and -5 VDC at 200 ma. The T/S computer section and 16K ram pack require +5 VDC and the 16K ram pack additionally requires +9 VDC to +12 VDC for the ram pack 4116 ram chips. Within the 16K ram pack is a small switching supply which provides -5 VDC, also for the ram chips and if this supply gives out (as it does quite frequently), then the -5 Volt output from this external power supply can be used.

The Radio Shack Switching Power Supply, #277-106, sells for $4.95 and requires an external transformer capable of providing 18 VAC at several amps. RS #273-1515 is the recommended transformer and costs $6.99.

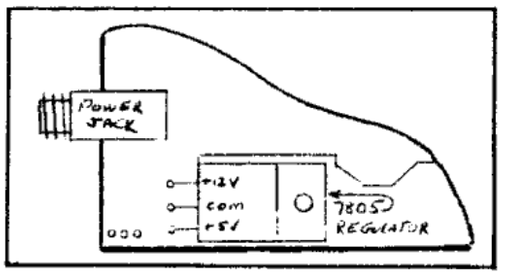
NOTE: Switching power supplies are the state-of-the-art for all modern computers and monitors. They are light weight and efficient. All components within the supply operate on the cool side and provide extremely reliable operation over long operating periods. The only objection to switching power supplies is that they emit a high frequency note as they oscillate. If the supply is cased, you will not hear it 'sing'.

For those of you that like to 'roll your own', I have provided a simple power supply circuit at the end of this article. I have used this circuit for my ZX 81 for well over two years and it never let me down. Several power supply circuits have appeared in previous issues of L.I.S.T. which can be adapted for your requirements.

The components stated in the parts list will provide you with more than adequate current output for the basic ZX 81 / TS 1000 with a 16K ram pack. You can, if you wish, use the 7805, 5 volt regulator when it is removed from your computer in place of the LM 323K regulator called out in the parts list. Bolt the regulator firmly to the metal case of the supply and use a heat dissipating compound between the regulator and the metal case.

If you decide to use an external power supply, unbolt the regulator mounting screw and carefully bend up the regulator leads. Desolder the regulator from the assembly and then clear each of the plated through vacated holes of solder. Prepare three eight inch lengths of #20 insulated wire by removing 1/4 inch of insulation from each wire end and tinning the bare wire ends. Insert the wires into the plated through holes on the computer board which the voltage regulator previously occupied and solder them in place. Rout the wires through the back end of the power supply jack (or remove the jack if you wish) and solder a male, multi pin connector to the bare ends of the three wires. A suitable connector set can be purchased at Radio Shack; male, 4 pin #274-224; female, 4 pin #274-234, at $1.09 each. The female connector will be connected to the external power supply cable.

The 12 VDC lead is soldered to the inside plated through hole; the common (ground) lead is soldered to the center hole and the 5 VDC lead is soldered to the hole at the edge of the PC board. It would be a good idea if each wire was of a different color or you can place a piece of tape around each of the wires for voltage identification.



COMPONENT GENERATED HEAT

A second source of heat comes from the ULA, IC-1. The ULA from my ZX 81 operated very hot - it self-destructed and a replacement had to be obtained from Sinclair Research, Ltd.

I contacted AAVID Engineering, Inc; 30 Cook Court, Laconia, NH 03246 and requested a sample of of their 40 pin IC clip on heat sink. Sorry, I don't have the part stock number. If you request a sample, please use business stationary for your request. You may also ask for the name of their nearest dealer selling the AAVID line of heat sinks in the event that AAVID will no longer provide a sample.

Calendar:

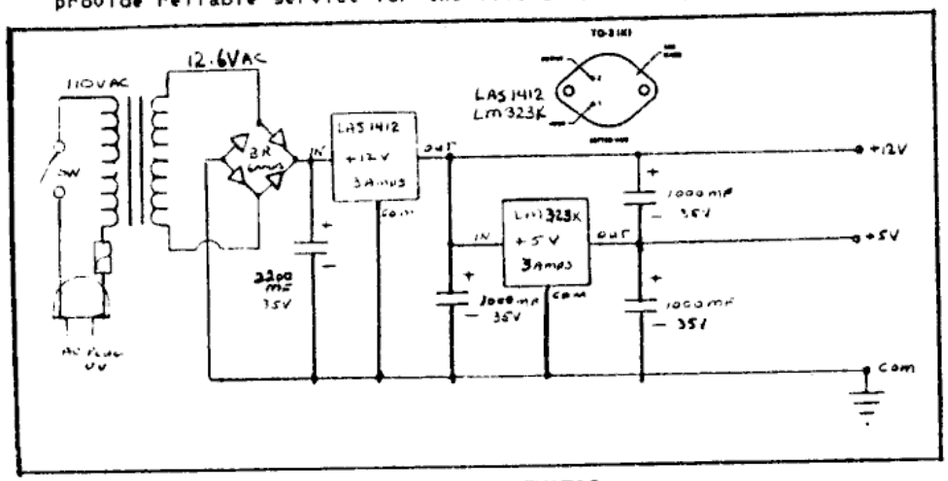
March 29 New York City Personal Computer Show and Sale - Apr 30th & 31st . Madison Square Garden (201) 297-2526

April 20, 21 - Trenton Computer Festival (10th Annual) - Trenton State College, Trenton, N.J. (609) 771-2487

List Group

Installing the heat sink is a cinch. Carefully pry up the ULA a little at a time on both ends using a small screwdriver. Please use the usual CMOS IC handling precautions to prevent damage to the IC from static discharge. Slide the heat sink over and under the IC (the ULA sits between two sections of the heat sink) and then push down on the heat sink/IC assembly to insure that the IC is seated properly in its socket. Examine the area around the heat sink to insure that any bare resistor or capacitor leads are not in contact with it. If necessary the aluminum fins on the heat sink can be bent upwards to correct any problem associated with component shorting.

You will find that the ULA now operates very cool and will provide reliable service for the life of your computer.



POWER SUPPLY SCHEMATIC

LAS 1412 +12 Volt, 3 Amp TO 3 voltage regulator		$3.50
LM 323K + 5 Volt, 3 Amp TO 3 voltage regulator		$3.50
B.G. Micro, PO Box 280298, Dallas, TX 75228		214-271-5546
12.6 VAC transformer at 3 amps	#273-1511	$5.99
Bridge rectifier at 6 Amps	#276-1180	$2.19
2200 Mf capacitor at 35 volts	#272-1020	$2.49
1000 Mf capacitor at 35 volts	#272-1019	$1.59

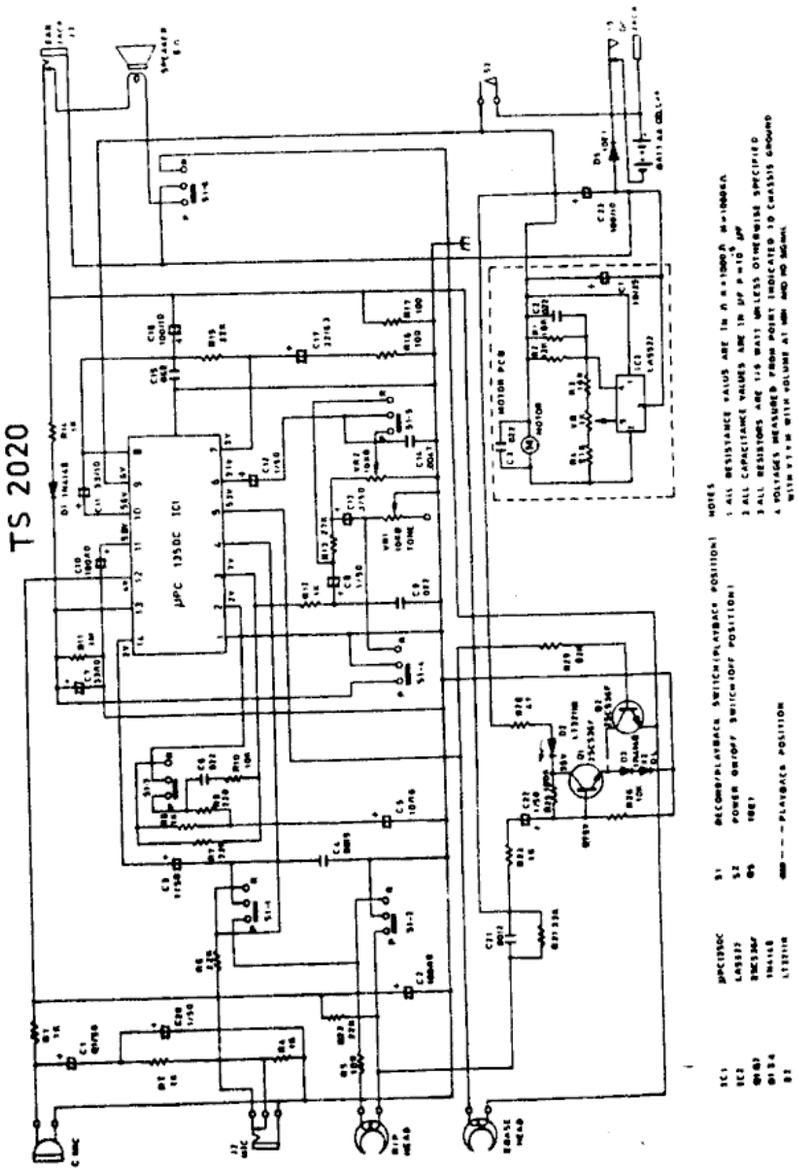
Your local Radio Shack
A line cord, switch of your choice, a 3 amp fuse, a metal case to house the project can also be purchased at RAdio Shack.

I realize that building or buying an external power supply can appear to be extravagant for a computer which may have cost as little as $29.95. However, I am forever greatful to the ZX 80 and the ZX 81 for introducing me to the world of home computing, which has provided me with computing knowledge and the ability and confidence to use this knowledge in business. I could never have had such a computer education for so little cash outlay. The extra cost for a power supply should be considered as an investment towards your computing future.

.....Bob Gilder

SCHEMATIC DIAGRAM

TS 2020



TS 2020 Computer Program Recorder

A CROSS-CORRELATION OF THE SPECTRUM ROM VERSUS TS2068

Part 4

As promised last month, a short routine for copying the contents of EXROM to RAM will be presented. The routine bank switches to the EXROM bank. This is acieved by outputting the EXROM chunk number (i.e. Ø1) to the Horizontal Select Register,HSR. The selection of the EXROM bank is also contingent on having bit 7 of port FF set. In order not to disturb the video modes, we first read-in the "status" of port FF into A register by an IN instruction, SET bit 7, and output to port FF. Now we are in the EXROM bank. We do a LDIR for the 8192 bytes of EXROM content to RAM location starting at 32768. Now we reverse the bank switching process, described above, and go back to Home ROM and return. The routine is as follws:

```
DI                          LD BC,2ØØØ
LD A,Ø1                     LDIR
OUT (F4),A                  XOR A
IN A,(FF)                   OUT (FF),A
SET 7,A                     OUT (F4),A
OUT (FF),A                  EI
LD HL,ØØØØ                  RET
LD DE,8ØØØ
```

Finally , this installment of the ROM Atlas is the last in the series. I also have an alphabetical and functionally classified cross reference from the TS2068 to Spectrum, similiar to Appendix A in the TS2068 Technical Manual. This type of cross refference is of course less useful than the ROM Atlas in this series, without a fully annotated disassembly of the TS2068. Still , if there is demand from LIST readership , we will publish the alphabetically arranged cross reference also. Lastly, I am hoping that the Atlas has eased the Spectrum software conversion process and helped MC programmers in fully utilizing their TS2068s.

SPECTRUM LABEL, NAME	SPECTRUM ROM Addr	TS 2065 ROM Addr	TS 2065 LABEL, NAME	TIMEX EXROM
peek	344C	3568		
usr-no	3483	3572		
usr-$	348C	3507		
TEST-ZERO	34E9	3904	TESTØ	
GREATER-0	34F9	3914		
NOT	3501	391C		
less-0	3506	3921		
FP-0/1	3508	3926	STBOOL	
or	351B	3936		
no-&-no	3524	393F		
str-&-no	352D	3948		
no-l-eql	353B	3956		
strs-add	359C	3987		
STK-PNTRS	35BF	39DD		
chr$	35C9	39E4		
val-&-val$	35DE	39F9		
str$	361F	3A3A		
read-in	3645	3A60		
code	3669	3A54		
len	3674	3A8F		
dec-jr-nz	367A	3A95		
JUMP	3686	3AA1		
jump-true	369F	3AA4		
end-calc	369B	3AB6		
n-mod-m	36A0	3ABB	INTDIV	
****	****	3AC5	LDNES	
int	36AF	3ACA	INT	
EXP	36C4	3ADF	EXP	
ln	3713	3B2E		
get-argt	3793	3B9E	ANGLE	
cos	37AA	3BC5	COS	
sin	37B5	3BD0	SIN	
tan	37DA	3BF5	TAN	
atn	37E2	3BFD	ATN	
asn	3833	3C4E	ASN	
acs	3843	3C5E	ACS	
sqr	384A	3C65	ROOT	
to-power	3851	3C6C	TO-THE	
****	****	3C99	SEPRNT	
(note:SEPRNT are tape msgs.)				
'spare'	3A6E	3CDC	'EMPTY'	
charctr-set	3D00	3D00	CH-SET	

SPECTRUM LABEL, NAME	SPECTRUM ROM Addr	TS 2065 ROM Addr	TS 2065 LABEL, NAME	TIMEX EXROM
SA-BYTES	04C2	0065	W-TAPE	
SA-LEADER	04D8	007E		
SA-LOOP	04FE	00A4		
SA-BIT-2	0511	00B7		
SA-3-BITS	0525	00CB	W-BORD	
SA/LD-RET	053F	00E5		
REPORT-D	0552	00F9	R-TAPE	
LD-BYTES	0556	00FC		
LD-BREAK	056B	0111		
LD-LEADER	0550	0126		
LD-SYNC	058F	0135		
LD-3-BITS	05CA	0170		
LD-EDGE-2	05E3	0189	RD-BIT	
LD-EDGE-1	05E7	0160	RD-EDGE	
LD-SAMPLE	05ED	0193		
SAVE-ETC	0605	01A8	SLVW	
REPORT-F	0642	0226		
SA-NAME	064B	0231		
SA-DATA	0652	0238		
SA-V-OLD	0672	029A		
SA-V-NEW	0695	02A9		
SA-SCRS	06A0	02B2		
SA-CODE	06C3	02DE		
SA-LINE	0716	0447		
SA-ALL	075A	04C9		
LD-LOOK-H	0767	04D6		
LD-NAME	07A6	0530		
VR-CONTROL	07CB	059F	VERIFY	
LD-BLOCK	0902	05C6		
LD-CONTROL	0906	05CC	LOAD	
LD-DATA	082E	0606		
LD-PROG	0873	0673		
ME-CONTROL	0886	06L5	MERGE	
ME-OLD-VP	08F9	0752		
ME-ENTER	092C	0799		
ME-ENT-1	093E	07CF		
ME-ENT-3	0955	0825		
SA-CONTROL	0970	0951	SAVE	
SA-J-SEC	0991	089A		

The balance of EXROM contains the Function Dispatcher , Bank Switching Code , and various other routines , which does not have counterparts in the Spectrum. A total of approximately 2K Bytes of EXROM is unused.

The Spectrum does not support the following routines:

****	1785	AROS
****	17CF	GETAL
****	17D4	VR-LN
****	17FF	VR-HNT
****	1806	VAROS

2040 TIPS

(*)(*)(*)(*)(*)(*)(*)(*)(*)(*)

Got a nice program listing with a tear in it? Or maybe something you want to add to your scrapbook? Thinking about taping it with cellophane? Well don't tape over any of the printing. It seems that the tape will fade the printing in no time. So watch it.

From Bob Dyl (EMC)

```
10  FOR  N  =  1 TO10
20  FORMAT "m"; i; "TEST"
30  NEXT N
40 CAT 1
```

This will "stretch" your m-drive cartridge tape and often increase capacity by 5 or 6K.

Try this.... TS 2068

```
    2 LET Q=160
    3 LET W=30
   10 LET C=PEEK 23606+256*PEEK 2
3607+256
   15 FOR J=32 TO 58
   20 FOR K=0 TO 7
   25 LET B=PEEK (C+K+J*8)
   35 FOR I=1 TO 8
   40>LET X=INT (B/2): LET BIT=B-
2*X: LET B=X
   45 IF NOT BIT THEN CIRCLE W-I*
2,Q-K*3,1
   50 NEXT I: NEXT K: REM PRINT '
': NEXT P
   54 LET Q=Q-20
   55 IF Q<130 THEN LET W=W+16: L
ET Q=160
   65 NEXT J: STOP
```

THE FORUM.

I ran into something I thought was strange. Try this:

```
10 LET a$="sample string"
20 SAVE "sample" DATA a$()
RUN (then rewind the tape)
NEW
10 LOAD "" DATA a$()
20 PRINT a$
30 PRINT a$()
```

This does not work! For some reason, if you SAVE a string using the DATA token, the string is saved and then can be loaded back into the computer, but not in a form that can be used.

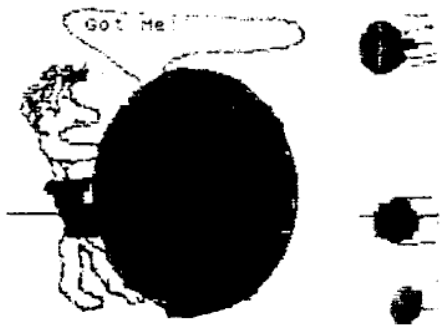
There is a simple patch that solves this problem by putting the string into a one dimensional array:

```
20 DIM t$( LEN a$)
30 FOR i=1 to LEN a$
40   LET t$(i)=a$(i)
50 NEXT i
```

If you SAVE t$, when you LOAD it back in, it can be used as a normal string. Do not ask me why

JUST FOR HerbeRT.

Switchboard



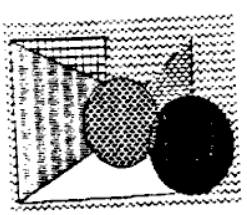
AND NOW IT'S TIME FOR THAT KEYBOARD WIZARD PROFESSOR A.'RAY'DIMM

Professor
How can I tell how much memory I've used up?
I got this program I've been working on my ZX81 and by the time I type it all in, my ZX81 starts acting a little senile.

Al S. Hymer

OK Al, just write this down (I know you have a lousy memory)
PRINT PEEK 16396+256*PEEK16397-16509
This will tell you the number of bytes you've used for the program, system variables, and display.
If you have a 2068, just use the FREE key.

CATS



T/S 2068 Keyboard Scanning

Most programs require user interaction through the keyboard,and use the INPUT or INKEY$ functions to do this job. This article will dis- some alternative ways to input through the keyboard.

Method #1: Hardware generated interrupts are used in the 2068 to update the TV frames counter and to scan the keyboard for pressed keys. If a pressed key is found, the character code associated with it is determined and stored in system variable LAST-K.If you POKE a zero in 23560,and then immediately PEEK the same location, the PEEK will return the code for a key pressed between the POKE and PEEK, provided that a scan has occurred in this time interval. To insure a scan, place a USR 737 after the POKE. This method is roughly like an INKEY$ function which returns a code rather than a string variable.

Method #2:If you are willing to use a small amount of machine code, you can directly call the ROM routine which examines the keyboard. This is K-Scan, located at 688d. (In the Spectrum, this same routine is at 028E (hex).)To use K-Scan, you need to know the position code system used in the T/S, and you need to be able to get at the D and E registers, which is where the position codes are located when a return is made from K-Scan to the calling routine. If no key is pressed, D and E hold 255; one key results in 255 in D and the position code in E; two keys results in position codes in both D and E. The position code is a value from 0 to 39, calculated as follows : (47-row #)-(8*column #). Here, a "row" means 5 keys in a half-row, such as A S D F G. Rows are numbered 1 to 8, starting with the lower left row and going up and then down . A "column" consists of 8 keys, such as column 2: Z S W 2 9 O L Break/Space.There are 5 columns, numbered 1 thru 5, starting with the outer keys.(Note that there are two redundant keys which are ignored; these are the space-bar and the right side cap shift; these are keys added by Timex which perform no new function but make the keyboard a bit more like a typewriter.)Unlike method #1 or INKEY$, method#2 allows you to handle two ( ) keys pressed at the same time.

Method #3: This method uses the IN function. For example, the BASIC statement LET A = IN 65278 will scan the 1st row (bottom,left, 5 keys) and assign to A a value of 31 if no keys are pressed. (Note: Some published programs using IN are for the Spectrom version 2, whose base value is 255, not 31.) If the keys are pressed the value returned is the base value (31) minus the column value of any key pressed. Column values are 1, 2, 4, 8, and 16 for columns 1, 2, 3, 4, and 5 respectively. The number following IN must meet certain cr teria. When expressed as a two byte binary number, the least significant ("low") byte must be the port number of the keyboard (i.e. 254 decimal). The most significant ("high") byte must have a "0" in the bit position corresponding to the row to be scanned. In the above example, 65278 in binary has as its high byte 11111110; since the zero is in the 1st bit position, the 1st row will be active when this statement is executed. Rather than get involved in decimal-binary conversions, you can also use a statement like: LET A = IN (256*BIN 11111110 + 254) to do the same thing. Note too, that you can put a zero in any position, or in any number of positions, in the binary number and simultaneously scan any combination of of rows with a single statement. (But, if you scan two rows at once, you cannot tell which row of the two a pressed key is in.) The BASIC equivalent of **K-SCAN** can be produced, of course, using eight IN statements. But unlike K-SCAN, you can detect the pressing of more than two keys.

Mike Morris

PROGRAMMER'S CORNER

Here is something I picked up from Chuck Dawson in the Ft. Worth User's Group Newsletter.

Did you know that you have access from the keyboard to all of the PRINT options, besides INVERSE? They are accessed from the extended mode,which is reached by pushing the CAPS SHIFT and SYMBOL SHIFT at the same time. They are:

```
EXTENDED MODE
        0-7 PAPER Color
        8   BRIGHT off
        9   BRIGHT on
SHIFT   0-7 INK color
        8   FLASH off
        9   FLASH on
```

You ask, "But Chris, how does this work?" Well, when you push these keys, the computer inserts what is known as control characters. Try this:

```
10 LET a$="__I_Love__My_Wife"
20 LET a$(1)=CHR$ 18
30 LET a$(2)="1"
60 PRINT AT 0,0;a$
RUN
```

If you look on page 240 of your user's guide, you will see that character 18 controls FLASH. The "1" character turns the flash on. Add this

```
40 LET a$(2)=CHR$18
50 LET a$(10)="0"
RUN
```

Using the same CHR$18 followed by a zero turns flash off,what if you use CHR$18 without a 0 or 1 following it? That's right! You get an INVALID COLOR error. BRIGHT is CHR$19 and INVERSE is CHR$20, and they both work the same way as FLASH.

The INK control (CHR$16) and PAPER control (CHR$17) work in a similar way, but the number that follows is the color number and should be 0-7.

Can you figure out how to use any of the other control characters?

EXTRA RAM.....

If you plug in the 16K Ram pack and find that the CLS function works more slowly and animation programs become unacceptable, try this it might help.

To have the maximun amount of RAM available while also having a fast CLS, adjust RAMTOP before typing or loading programs.

```
POKE 16388,254
POKE 16389,76
NEW
```

PROGRAMS

Bante Software has provided an interesting program to us

ON/OFF status of TS2040 printer

"As must be obvious, the REMark statement is a short machine code routine which must be the first line of the program. The other lines can be anywhere in the program and could be modified to give other messages. In the 1000/1500 version the inverse character in line 1 is "S". Also the less than/greater than in the 2068 version and the less than/equal in the 1000/1500 version are each single keystroke entries.

2068 Version

```
   1 REM FLASH CLS 0 THEN LN
9996 LET PRT=USR (5+PEEK 23635+2
56*PEEK 23636)
9997 IF PRT 16383 THEN PRINT "PR
INTER OFF"
9998 IF PRT =16383 THEN PRINT "P
RINTER ON"
9999 STOP
```

1000/1500 Version

```
   1 REM  = CLS 'SCS STAR
   2 POKE 16514,71
9996 LET PRT=USR 16514
9997 IF PRT=16383 THEN PRINT "PR
INTER OFF"
9998 IF PRT =16383 THEN PRINT "
PRINTER ON"
9999 STOP
```

CCATS ~ ABILENE

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